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ONE HUNDRED AND FIFTY YEARS*

From Tallow-dip to Television

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IT would be a neglect of duty and show a want of respect did we not pause, at this halfway mark in our second century, to recall and give praise to our founders. Their story often told, by James Thatcher of Plymouth in 1828, by Samuel Abbott Green in his Centennial Address fifty years ago, by James G. Mumford, that gifted writer who had he lived would have been the proper person to deliver this address today, by our beloved Secretary Walter Burrage in that invaluable source-book published only eight years ago, and still more recently by Henry R. Viets, as this Society's contribution to the Tercentenary Celebration,—the story, I say, though often told can never grow stale from retelling on occasions such as this.

1781

A century and a half goes a long way back in the short history of our country. Another stretch of equal length takes us to the wilderness with its coast-line fringe of scurvy-stricken and stockaded settlements whose establishment we have so recently been celebrating. When a medical student here in the '90's, I once accompanied a friend to Plymouth to take Thanksgiving dinner with his grandmother. This charming old lady, who had lived to see more than eighty such festivals, pointed to the symbolic three dried grains of Indian corn by her plate and remarked that only two people stood between her and the child that was born on the "Mayflower"; for her grandfather had once told her that he knew an aged man who as a youngster had witnessed Peregrine White's funeral.

That was forty years ago and despite this passage of time four persons might still easily relay the same period—even three should they have followed the prescription for longevity recommended by that vigorous centenarian, Edward Augustus Holyoke, the first President of this Society who is surely with us in spirit at this gathering. In his childhood there were persons still alive who had participated in that migration of sturdy and God-fearing Puritans from East Anglia to our shores; and only a hundred years have passed since he, on his one hundredth birthday, dropped his practice in Salem long enough to come here and give this Society his benediction.

To most of us in this audience Armistice Day of 1918 is still a recent memory. Fifty years ago at the time of our centennial celebration the surrender of Lee at Appomattox was an equally vivid episode and those who had then seen military service were still young—almost as young as are today's veterans of the Great War. "There are those here present [said Samuel A. Green in his Centennial Address] who have been obliged to perform severe operations of surgery, in the dark hours of the night, by the faint glimmer of smoky candles and dingy lanterns, on an extemporized table, or perhaps with no table at all." And he goes on to give a long list of the medical officers from Massachusetts, his friends and comrades, who were either killed in action or died during or after the war from illness contracted in the Army.

The real horrors of that prolonged struggle for preservation of the Union were not for Northerners to know, and the devastation of the late war affected another continent than our own. Even so, we favoured ones of the present day have seen enough of the postbellum state of mind to realize how unsettling and disillusionizing is the period of reconstruction during which the generation growing up is at loose ends and the generation suddenly grown old distraught for want of some constructive programme. This has been the inevitable aftermath of any long-drawn-out war both for victor and vanquished though it is not what our school histories are prone to dwell upon.

But these two wars were only four-year conflicts, our distant share in the last of them having been only half of that, whereas over six years of turmoil and uncertainty had already passed and the end was not yet in sight (far less the ratification of peace) when at the instigation of fourteen Boston doctors, on May 11, 1781, an *Act to Incorporate certain Physicians by the*

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name of the Massachusetts Medical Society had its first reading before the Legislature of the Commonwealth.

To be sure, with the evacuation of Boston by the British, the campaign had long since moved out of New England and just now, after that discouraging winter when Washington had managed to hold his ragged, unpaid and nigh mutinous troops together, it was moving from the Carolinas into Virginia. That Cornwallis was soon to be trapped in Yorktown Washington himself could scarcely have foreseen, much less this group of Boston doctors who were probably as war-weary as were people elsewhere. What is more, the prosperous among them, as was natural enough, if not actually out of sympathy with the rebellion were "near" Loyalists, some of them indeed having seen service with the British. So it is all the more remarkable that at such a time and under such circumstances a constructive programme for the betterment of professional conditions in Massachusetts should have been successfully launched.

Who were these men—our fourteen Boston founders—who for the better part of a year had been holding meetings at the Green Dragon Tavern off Union Street and whose corporate number was soon to be increased by the addition of seventeen more, chiefly from other parts of the Commonwealth which then included the District of Maine? Some years ago, I had occasion to seek information regarding the settlement of what was once called Upper Canada which at the close of the Revolution came to be split off from the Province of Quebec. The first governor of this new province was General Simcoe who had been Lord Cornwallis' Chief-of-Staff and a large proportion of the settlers that took up land grants were either retired army officers or those who continue to be referred to across the border as "U. E. [United Empire] Loyalists." And I was told by a Toronto historian that people in the States were encouraged to forget that from Massachusetts to South Carolina most of the prosperous and well-to-do persons in the Colonies at the outbreak of the revolt got back to England if they could or, like Sir William Johnson with his Mohawks, made their way as refugees across the border to settle in Canada.

History is what historians choose to tell us, and the names of the Boston doctors who joined the Tory exodus from these parts to Halifax at the outbreak of the rebellion is unrecorded. They were doubtless the élite of the profession who were often seen at Province House and were well content with the established order of things. We need not be surprised, therefore, to find that of those who remained to found this Society seven were young men from twenty-two to thirty-two years of age, almost all of them having seen active military service, whereas the other seven, all older men, were either acknowledged Loyalists or were known to have had a lukewarm sympathy, to say the least, with the uprising. Even Edward Holyoke was induced by some of the substantial merchants among his Salem patients to sign a political manifesto favourable to the Royal Governor—a step he found it expedient ere long publicly to recant.

The "Tories" were but Conservatives by another name and their satisfaction with things as they stood was natural enough. Well established in practice, the war meant the scattering of their clientele; and such of them as felt obliged for one reason or another to remain and face unpopularity, had no easy time. James Pecker, the oldest of the group, in his fifty-seventh year, had narrowly escaped arrest, and Samuel Danforth only did so by temporarily absenting himself until long after the Evacuation when the intensity of local feeling had quieted down. James Lloyd, who had received first-hand from the two celebrated Williams—Hunter and Smellie—that knowledge of midwifery which made him the leading obstetrician of the colony, had long held the position as Surgeon to the British garrison. With the notable exception of Joseph Warren, most of Lloyd's many pupils inherited his political sentiments and some of them, like John Jeffries, enlisted in the British service. Thomas Kast had been an officer in the British Navy before he turned to medicine and walked the wards at Guy's and St. Thomas's Hospitals; and Charles Jarvis had not only been educated in England but had married into a prominent English family. They had much to give up.

To weld these discordant elements into a common society while the outcome of the war remained uncertain was a genuine accomplishment. Who the ringleaders may have been is now impossible to say; but almost certainly they were the younger men, and from what we know of his subsequent career it is not at all unlikely that John Warren, scarce turned twenty-eight, provided the yeast in the dough. "An artful man," said a contemporary, "certain to get to the windward of us all." After two years in active service he had returned to Boston and been put in charge of a military hospital where, on unclaimed bodies, he soon began giving anatomical lectures to army doctors. What he had to do with the founding of the Humane Society, the Academy of Arts and Sciences, the planning of the Massachusetts General Hospital, and the establishment of an embryo Medical School in Cambridge, beside presiding over this Society for a period of eleven years is well known; but it is less well known that he meanwhile was obliged to provide the wherewithal not only for the upbringing and education of his own seventeen children but of his older brother Joseph's five who had been left fatherless since that eventful day on Bunker Hill. Of such stuff were our founders made.

We easily forget what distances they had to

cover. From Boston Common to Harvard College is now a matter of ten minutes by subway; but John Warren, when the weather was such as to make the water-crossing to Charlestown precarious, was obliged to trek along Boston neck through Roxbury and Brookline a good seven miles to Cambridge to give his anatomical lectures to the Harvard seniors. A pleasant enough walk for a summer's day but in the winter months when college was in session it was a wearisome journey even astride a horse. Still these lectures were worth the labour and time had they done nothing more than turn toward Medicine the thoughts of a young undergraduate listener named Jacob Bigelow of whom we shall soon hear more. Distances, indeed, were then so great that Dr. Holyoke, still in his vigorous middle age, came only once all the way from Salem to preside over our sessions. And when we consider that it was fifty-four hours hard travel by stage to New York over a well-beaten road, there was every reason for our members from far away Berkshire to feel disinclined to pay dues to a Society which chiefly benefited the members from Suffolk. They expostulated about this in vain and finally clamoured for a separate organization.

With its population of some 12,000 persons the town of Boston was still a most primitive place. There are dwellers on Beacon Hill today who are legally entitled to pasture and exercise multiples of two legs on Boston Common—two legs a goose—four legs a cow—six legs a cow or a pig and a goose. Of friction matches to light a fire, of coal to heat the draughty clapboard houses in winter, of refrigeration to preserve food in summer, there was none. The water from the wells was brackish, the slops went into the gutters of unpaved streets, and there were no rubber overshoes to protect leather from snow and slush. Doctors visited their patients shanks-mare in good weather or, if fortunate, astride a horse in bad. Phthisis was prevalent and in winter-time the children died overnight of membranous croup, the old of pneumonia; in the summers agues, fevers and fluxes took their seasonal toll. Only the sturdy survived and even they were almost certain to have pockmarked faces for smallpox, scarcely checked by inoculation, was endemic. Of all this, familiarity bred a certain contempt. It was only when actual pestilence such as cholera and yellow fever gained a foothold that terror, such as we no longer can appreciate, struck deep in the hearts of the people. But when these times came—

> None too learned, but nobly bold
> Into the fight went our fathers of old.

1831

Fifty years go by and 1831 sees the passing, at fourscore, of Thomas Welsh, the last surviving founder, the venerable Edward Holyoke—at five score and one!—having preceded him by only two years. The Town has become a City wisely governed for six years past by the first Josiah Quincy, even to the point of having a modest department of health. Some streets are being paved if only with a central strip of pebbles, and there are cobblestone sidewalks broad enough for a single wayfarer. Jamaica Pond has been tapped for water which is brought to the town in buried conduits of wood. The question of sewage disposal is under discussion. And preparations are being made to utilize gas from the works at the foot of Copps Hill to light the principal thoroughfares.

In all this effort to make the young City a model of sanitation, the doctors, by now a well-knit group, lend their combined influence. Times have greatly changed. It is a buggy more often than a two-wheeled chaise at the door which now betrays the doctor's visit. The projected hospital, already become famous, has adorned the banks of the Charles nigh twenty years and the medical school, long since transferred from Cambridge, is in active operation. But it must stir itself if it is not to be outdone by a rival institution in Pittsfield set going, under the able and energetic leadership of Henry Halsey Childs, by the Berkshire members who still feel out of touch with the parent society. And well they may, for with Robert Fulton's steamboats plying the Hudson they are in point of time much nearer to New York.

I happen remotely to know something of this for my great-grandfather practised in the Berkshires till 1815 when he died of what was called typhus caught while caring for fever-stricken prisoners brought down to North Adams after the Battle of Bennington; and eight years later his son after a period of apprenticeship entered the Berkshire Medical Institution in its opening year with Mark Hopkins as a friend and classmate.

Meanwhile to this maritime region great prosperity has come. Yankee Clipper Ships, the pride of the seas, are seen in every foreign port where trade is to be found. More young graduates in medicine than ever before can afford a postgraduate period of study abroad, and the fame of Bichat, Laennec and Louis, of Flourens and Magendie, of Depuytren, Velpeau and Cruveilhier has been luring them to Paris. Those that have returned are full of new ideas concerning fevers, the taking of clinical histories, the value of medical statistics; and they produce tubes to listen to the sounds in the chest in imitation of their recent master, he of the sweet-smelling name. And some of them, thanks to a man named Daguerre bring home for parents or sweethearts that latest marvel, their image on a tin plate which is to replace the old black-paper silhouette of bygone days.

To be sure, not all the rising generation had moved in this familiar groove. There were nonconformists then as now. One of them, an ap-

prentice of Jacob Bigelow's, that Byron-mad young adventurer, Samuel Gridley Howe, has just returned to Boston after four years' absence spent as a participant in the insurrection against Turkish rule in Greece. Not for him to slip back into the old groove. Mature before his time, he is turning over in mind the problem of educating the blind — more particularly those born blind. Fame is a vapor and reputation an accident. His wife ere long was to become celebrated overnight on a hymn of battle, whereas his name has become lost in the fame of the Perkins Institution, of which he was Superintendent for forty-three years, and in the reputation of Laura Bridgman, his most celebrated pupil. Nor need we forget that it was he, when on a visit to England, who encouraged the young daughter of his friend Nightingale in her ambition to become a hospital nurse, which would by no means be the dreadful thing others had said it would be.

James Jackson is now, in 1831, nearing the end of his seven-year period as President of this Society, at whose annual meeting, to judge from the meagre report in the three-year-old *Boston Medical and Surgical Journal*, no reference is made to its being a semi-centennial anniversary. But a fiftieth milestone of a local society meant little or nothing with similar organizations everywhere coming into existence like corn popping in a pan. It was a time to look forward, not back. The first great migration of the people to the West in covered wagons was going on and things of great medical significance were happening on the very frontiers—in the village of Danville, Kentucky, where a man named McDowell has been successfully removing ovarian cysts; at a remote army post on the distant island of Mackinac where, thanks to a charge of buckshot which left a permanent hole in the belly of a young French Canadian, a man named Beaumont has been shedding light on the mystery of gastric digestion. Given the divine spark, it may burst into flame in a setting however primitive.

It was in this same year of 1831 that cholera swept over Europe and when in due course the epidemic reached this country its ravages in Boston were checked by the wise sanitary rulings of Jacob Bigelow then in his prime and soon in turn to preside at our meetings. Botany so essential to materia medica was still one of the principal medical disciplines; and Bigelow's magnificent treatise, with its engravings devised and printed in color by himself, is outranked only by the Opera of that other doctor botanist, Asa Gray. And his Annual Discourse "On Self-limited Diseases" shortly to be delivered before this Society put many an apothecary out of business by its vigorous scepticism in regard to the superabundant drugging to which the profession had been all too long addicted.

It was in this same year also that the legislature passed "An Act more effectually to protect the Sepulchres of the Dead, and to legalize the Study of Anatomy in certain Cases." In the course of the debate it is stated that:

> "An honorable member from this city, after expressing very briefly, but impressively, his accordance with the sentiments expressed in this bill, added, that so solemn was his conviction of the great benefits to society of human dissection, and of its unqualified necessity to the comfort and happiness of mankind, that it was not improbable he should make, in his will, such a disposition of his own body."

And so he did: for John Collins Warren, holding the combined Chair of Anatomy and Surgery in the local school, well knew that could this bill be passed it would mark the end of those gruesome nocturnal expeditions in which students were accustomed to engage to provide themselves and their teachers with the material necessary for their training. The few standard operations then undertaken had to be done with speed and dexterity for which a precise knowledge of human anatomy was essential. But something more than this was needed to make surgery what it was to become—two things, indeed, of which we begin shortly to see the foreshadows.

Plans were on foot in this year of 1831 for a lying-in hospital which for want of knowledge was soon to find itself a place, like most others of its kind, to be shunned as a pesthouse. All were fully aware of this, but when a youthful member of the Massachusetts Medical Society, who had shown a capacity to write prize-winning dissertations, published in 1843 his essay "On the Contagiousness of Puerperal Fever" a storm of criticism was aroused. He was not an obstetrician himself, indeed was without medical experience of any kind, for practice never came his way—a fact which he took humorously: "Small fevers gratefully received." What business had such a one to assert with arguments unanswerable that the blame lay at the man-midwife's own hand? Seventy years before this Charles White, the obstetrician of Manchester, England, had said much the same thing and it had been forgotten. Even now the time was not yet ripe and the profession had to wait for the Hungarian Semmelweis finally to ripen it after an interval of nearly two decades.

A year before Dr. Holmes had so definitely called attention to the principal cause of puerperal sepsis, a still younger man in the village of Jefferson, Georgia, having accidentally noted the stupefying effects of inhaling sulphuric ether, was undoubtedly the first to employ the drug for the purpose of what we call surgical anaesthesia. He published no report of his observations and, even did he realize their significance, he was scarcely in a position to make himself heard. Holmes had an audience but no opportunity to put his views to the test. Crawford Long had accidentally hit upon one of the great discoveries of all time, but he had no audience. And probably neither of them had

the crusading spirit and combative vigour necessary to force their views upon a reluctant and traditionally conservative profession.

In science credit goes to the man who convinces his contemporaries, not to him who first propounds the idea. The medical world was unprepared for a statement published in 1800 by Thomas Beddoes' young assistant at the Medical Pneumatic Institution set up at Clifton, England, to study the treatment of disease by respirable gases. Humphry Davy was much excited by his discovery that nitrous oxide was "respirable"; but no one else seems to have been aroused by his published statement that it "appears capable of destroying physical pain and may probably be used with advantage during surgical operations". Thomas Beddoes unfortunately was not interested in surgery, and it was left for an obscure dentist in Hartford, Connecticut, forty-four years later to put this idea to a practical test which was checked by the misfortune of a fatal accident. One shudders to contemplate what might have been the setback to surgery had a similarly fatal accident occurred on that momentous October 16, 1846, in the dome of the Massachusetts General Hospital when J. C. Warren permitted an unknown person to administer by inhalation an unknown drug to a patient during the course of a hurried operation. Can one say that the time happened at last to be ripe for surgical anaesthesia or should we grant that Morton succeeded in ripening it?

The possibility that a man may be able to ripen his own time—which I hasten to add is not a fancy of my own—is worthy of thought. One traces the conception of *contagium vivum* to early times; and the soporific sponge used at the School of Salerno was an ancient tradition. No idea is wholly new; what *is* new is getting people to adopt it and to act upon it. We know from his Notebooks that Leonardo fairly bristled with novel ideas, but, whether from indifference or inability, failed to register them on his contemporaries. He was probably a more observant and skilful dissector than the youthful Vesalius who, however, had the vigour and determination, when the world was content with Galen, to enforce upon his contemporaries the ripening of modern anatomy. And so did Harvey for modern physiology, though instead of a huge folio it was a small, badly printed tractate of seventy-two pages full of typographical errors which turned the trick—and incidentally ruined his practice.

Even the written word must find its audience. An unknown Augustinian monk has no chance to ripen his time and thirty-five years must elapse before de Vries calls attention to the important law Mendel had discovered and published in an obscure journal. Darwin might not alone have convinced his contemporaries, or "The Origin" even been read, had the theory put forward not had a doughty protagonist in the person of Thomas Huxley. And in more recent times, Willard Gibbs is an example of another who was ahead of his time and either did not realize the full significance of what he had done or cared not at all.

Who possibly can tell how often precious fruits of brilliant minds have been unrecorded windfalls? In this day and generation some like Einstein and the lamented Michelson appear to have the capacity to ripen time for their revolutionary ideas even though the vast majority of people are at a loss to know what it is they are talking about. So the discoveries that revolutionize medicine may sometimes, like that of Laennec and of Jenner and of Röntgen, find the time apparently ready for their reception whereas others either make no impression or are vigorously combated. Opportunity, personality, position, chance, in addition to vision and the prepared mind—all have a hand. If Oliver Wendell Holmes had been a visiting physician to the new Lying-In Hospital and had set about aggressively as did Semmelweis to prove his doctrine: if Crawford Long had remained in Philadelphia to become surgeon, let us say, to the Pennsylvania Hospital where he might have tried out his idea and gained an audience as did Morton at the hands of J. C. Warren and his surgical colleagues—what a different setting there might have been for these signal events of our second fifty years.

1881

Let us move on to the time of our centennial. It is still a horse-drawn era though a network of iron rails is rapidly making the country smaller, and that convenient nuisance, the telephone, is already installed in some progressive doctors' offices. There are members of this society still active who attended that celebration and visited the new abattoir at Brighton, lunched in Memorial Hall, took an excursion down the Harbour, and at the annual dinner the next day listened to toasts and speeches—not forgetting a "brilliant and sympathetic poem" by Dr. O. W. Holmes, "read in his own admirable manner". Professors of anatomy still write poetry, I'm told, but they now keep it dark by anonymity.

The more fortunate among the younger men at that centennial gathering were fresh from their postgraduate studies abroad but the talk was now chiefly of Vienna and the *Allgemeines Krankenhaus*, no longer of Paris, of *La Pitié*, and the *Neckar*. Only one possible member, so far as I know, had been trained in Paris, the grandson of Jacob Bigelow, who having been given a place in the laboratory of a certain M. Pasteur, on the pretense that he could blow glass, became his first and—with one later exception, if I am not mistaken—his only American pupil. With vision what profit might we

not have made out of this adventure! But on his return in 1879, who showed the slightest interest in the cultivation of microscopic organisms and the disproof of spontaneous generation? No one. And instead of becoming the pioneer American bacteriologist the only opening for Sturgis Bigelow was in a surgical outpatient department from which he soon resigned to abandon medicine altogether. Five years must elapse before experimental pathology and bacteriology, transplanted with its Teutonic roots by Welch and Prudden, is finally to get a secure footing in America. A German-trained pathological anatomist, to be sure, we already had—and few have been more famous—but Reginald H. Fitz was a pupil of Rudolph Virchow and like Osler, another pathologist-physician, returned from abroad too soon for a training in bacteriological technique.

It was in August of this very year of 1881 that the great International Medical Congress under the presidency of Sir James Paget was held in London, and there Henry J. Bigelow gave a demonstration of his ingenious method of treating stone in the bladder. It is highly doubtful whether he could have heard, or, if he did hear, whether he understood any better than many others who were present, the significance of the address, given by his son's recent teacher this same M. Pasteur, on "Vaccination in Relation to Chicken Cholera and Splenic Fever." It was at the conclusion of his discourse—and before paying a tribute to Jenner—that Pasteur said:

"In France, we lose every year by splenic fever animals of the value of 20,000,000 francs. I was asked to give a public demonstration of the results already mentioned. This experiment I may relate in a few words. Fifty sheep were placed at my disposition, of which twenty-five were vaccinated. A fortnight afterwards, the fifty sheep were inoculated with the most virulent anthracoid micro-organism. The twenty-five inoculated sheep resisted the infection; the twenty-five non-inoculated sheep died of splenic fever within fifty hours. Since that time, my energies have been taxed to meet the demands of farmers for supplies of this matter. In the space of fifteen days, we have inoculated in the department surrounding Paris more than twenty thousand sheep and a large number of cattle and horses."

Was such an announcement as this headlined in the medical press? It was scarcely noticed. Such a demonstration might be of interest to sheep raisers, but what had it to do with the practice of Medicine? Had not that irascible Benjamin Waterhouse of Cambridge carried out on Noddle's Island under the auspices of the local board of health a precisely similar experiment eighty years before by first vaccinating nineteen children with cowpox and three months later the same nineteen with the virus of smallpox which failed to "take"? That was a demonstration worth talking about!

We Americans appear to have had a peculiar blind-spot in the eighties which prevented our seeing in their true light and proportions the two great revolutionizing movements that were under way. Neither Lister nor Pasteur appears, with the single exception I have mentioned, to have attracted any pupils from the United States. Lister had had visitors of course. During his last days in Glasgow in 1869 the second J. C. Warren had paid him a brief visit on the conclusion of his long period of study abroad—had indeed brought back with him some lac plaster and other samples of the antiseptic dressings of the time. But with such new-fangled business a mere surgeon to out-patients makes no great headway. Wounds heal well enough by the old methods, and as for abdominal operations, except under dire emergency, they'd better not be done at all at least in a hospital that cares for its reputation. Consequently the particular John Homans (tertius) of that epoch, being an independent and venturesome soul, began to separate the women of New England from their cumbersome ovarian cysts on his own responsibility in a mist of carbolic spray at a private nursing home.

All this new talk regarding microscopic plants and their relation to the infectious diseases was not easily taken in by the older generation in the early eighties though scarcely a month passed by without some new definitely pathogenic organism being isolated—anthrax, malignant oedema, the streptococcus, and gonococcus, the lepra bacillus, the pneumococcus, Eberth's typhoid bacillus yesterday, Laveran's malarial parasite today, and tomorrow—most important of all—the tubercle bacillus. Nor was the relation of bacteria to the surgical infections quickly grasped or wholly welcome in spite of the fact that Joseph Lister, now four years in London, with fortitude, patience and dignity was slowly but surely ripening *his* time. What was important was not so much carbolic acid and the much debated "spray" as the great underlying principle that was involved; and this the Germans had been the first unreservedly to accept.

Efforts, to be sure, were being made by American surgeons also to fathom the depths of Lister's pronouncements. But without a training in bacteriology no surgeon can well understand the real meaning of wound infection, far less know how to prevent it. This training Sturgis Bigelow had had, and at a meeting on "Wound Management" before the Suffolk District Medical Society on April 15, 1881, he said:

"Every antiseptic operation ought to be carried out with as careful attention to the small details as if it were an experiment in spontaneous generation. . . . A single wipe with an imperfectly disinfected sponge is as sure a manoeuvre as could be devised to invalidate the effect of every other precaution."

If I am rightly informed, Henry O. Marcy of Cambridge was at the time almost the only ardent advocate in this community of the com-

plete antiseptic ritual, while others, if interested at all, took a middle ground in the controversy—to spray or not to spray. Fifteen years later in the days of my house-officeship, surgery was not very effectively one thing or the other—intelligently antiseptic or aseptic. We then swabbed our patients' wounds with sea-sponges that were merely wrung out in tap-water and soaked overnight in crocks of carbolic acid, to be used again the next day.

Marey's voice at the London Congress during that celebrated symposium "On the Causes of Failure in the Primary Healing of Wounds" was a small one compared with the thunders of Lawson Tait against the antiseptic methods and of Richard Volkman in support of them. The time finally came for Lister to close the debate. He made no particular defence of any special technique. He contented himself with the description of further carefully conducted experiments (which he had been obliged to perform abroad owing to the recent anti-vivisection law), showing among other things that blood serum itself possesses bactericidal properties and that the actual closure of a wound is not essential to perfect healing, for healing in the absence of inflammation may occur in an open wound filled with a blood clot if it be properly covered and left alone.

Out of all the Congressists in that vast assembly there were perhaps only two besides Lister who could by any possibility have foreseen that these new experiments had sounded the knell of active surgical antisepsis and at the same time had announced the birth of something far better, even though more difficult to carry out. These two, so soon after the Franco-Prussian War, were difficult to bring together, but it was somehow accomplished. And though it is not even recorded in the copious *Transactions* of the Congress, unquestionably the most important happening of that eventful week of August 1881 was when Robert Koch, in the presence of Lister and Pasteur, one afternoon at King's College demonstrated his new method of cultivating bacteria in solid media and showed the efficacy of steam sterilization. Meanwhile, possibly that very afternoon, Clifford Allbutt was reading at one session on Scrofulous Glands of the Neck, and Theodore Kocher at another on Strumous Disease of the Knee Joint, wholly unaware that on his solid media this same German doctor had, likely enough, already cultivated the minute bacilli which proved that the scrofula, and struma, and tubercle of our forefathers were one and the same disease.

But to the Congress at large all this about microbic infection was a minor issue. There were far greater attractions with Charcot to hear, and Donders, and Hughlings Jackson on epilepsy, and Virchow in defence of experimentation on animals, and Thomas Huxley on the connection of the biological sciences to Medicine, and our John Shaw Billings on medical bibliography, the first volume of the Index Catalogue, one of the major contributions of this country to scientific medicine, having just been published.

So in this year of 1881 two months after this society had celebrated its modest centennial, the great figures of the medical world were gathered in London; their words we still quote; on their broad generalizations we still build. In 1913 another, the last of the great international congresses, was again held in London and though the gathering was double the size, with the possible exception of Paul Ehrlich there was no one to be mentioned in the same breath with those whose names I have briefly recalled. Meanwhile in those glorious years that come between Pasteur's demonstration of protective inoculation against anthrax and the introduction by Ehrlich of chemico-therapeutics which made pharmacology a science, Medicine found herself wholly transformed. And then in another year—the disaster, from the ruins of which the world is still trying to extricate itself.

1931

Every generation is prone to overvaluate its own accomplishments and to feel that it has lived through the most eventful era in history. So it is music in our ears to be told that this recent half century has seen the greatest progress of all. Not everyone is entirely happy about it, for with standardization and mass production and the mechanical robot has come a vast deal of unemployment and any day some new machine or centralized control may throw still more of us out of work. But despite the talk there is nothing new in this. Five centuries ago countless scribes and illuminators were obliged to find other jobs because of that robot, the printing press with its movable type, an unwelcome invention which transformed their world far more than has the gas-combustion engine ones.

Nevertheless, science and those who apply its discoveries have in these recent years provided us with an amazing hodge-podge of novel and revolutionizing things to which we are obliged to adjust ourselves whether we wholly like it or not. The telephone, the incandescent lamp, the dictaphone and the typewriter, the automobile and the aeroplane, the x-ray and radium, wireless messages and vitamines, motion pictures and television, have come, for better or for worse, permanently to change our very manner of thought of life and of living. From Zeppelin to submarine, the most fanciful imaginings of Jules Verne have been outdone in fact. All that remains is for the cow to jump over the moon, and she may be expected to hop off any day now that two Belgian physicists have found the stratosphere to be so accessible and such a pleasant place when you get there.

There is a disagreement among modern astronomers as to whether the universe is expand-

ing at such a rate it will some day wholly disintegrate, or whether it is constantly regenerating itself by cosmic rays let loose while helium atoms are in the process of formation. We might well ask whether Medicine too is not expanding at such a rate it is likely to disintegrate and whether something can't be done to insure the constant regeneration of those fundamental principles which from the beginning have made our professional standing and solidarity what it is. Since Medicine has become "news" our ancient code of ethics tends to be neglected—along with the Ten Commandments and the Golden Rule—as something unsuited for these advanced times. Huge hospitals have been built richly endowed by great foundations. Magnificent laboratories fully equipped for research are at every hand awaiting the right people to utilize them for further discoveries which, like the cause of cancer, will bring fame to someone. Meanwhile the torch which passed in turn from Italy to Holland to Scotland to England to France to Austria and Germany has passed, or is in process of being passed, to our own country where foreign medical graduates now flock as our ambitious and favoured graduates once flocked abroad.

Are we entirely prepared for this? And are we, in our process of rapid expansion, not running the risk of losing something precious that made our medical forebears what they were? Medicine has always utilized scientific discoveries but can never become a science so long as it has to do with individual human beings. As of old, life is short, the Art long, opportunity fleeting, and yet, our preliminary requirements for all who wish to join our ranks are such that an education for medicine has come to be drawn out to cover a period of six to eight years. The practising doctor of today will express his gratitude to those who have given him some conception of the sciences which have sprung from the loins of medicine; but he will join with the doctors of all time in saying: "I honour as my father the man who taught me the Art."

I can imagine old Dr. Holyoke, with whom in his Salem home thirty-five apprentices in succession had worked elbow to elbow, appearing among us and bluntly asking questions embarrassingly difficult to answer:

"Your scientific progress is very wonderful, but are you on the whole training your students to be as good doctors as we made of them in the old days, and do you yourselves hold as strong a position in your several communities as the doctors once held? If so, who are these chiropractors and Christian Science healers that infest the land and thrive on that inherent trait of mankind—blind credulity? Does not the long and expensive science training now demanded for a medical degree have something to do with their birth and prosperity, and the sum-total explain in part the high cost of medical care?

"What are these richly endowed anti-vaccination and anti-vivisection societies that I am told continue, with the aid of clever lawyers, to pester our profession and hamper its progress? Are leaders in this Society no longer to be found serving in the Legislature? Have you forgotten that two of our early members were Governors and three of them Lieutenant Governors of the Commonwealth? Your professional public health officials must certainly exercise a greater influence on public opinion than did those amateur ones who volunteered their service in my later days?

"Did not my friend and neighbour, Joshua Fisher of Beverly, one-time President of this Society for a term of eight years, get the Legislature to pass what laws were needed for proper licensure, and at one time become a State Senator, and at his end establish the professorship at Harvard that made possible the services of Asa Gray? You never heard of him! Well, you certainly have heard of my protégé, John Warren, and my pupil, James Jackson, and his junior colleague, Jacob Bigelow, most brilliant of them all. Men who are poets and wits don't always carry weight. But here was one seething with ideas, one to whom people listened, one who got things done—one who could by earnest, persistent and intelligent persuasion (to borrow the phrase I've just heard) "ripen his time". The first Institute of Technology; the first rural cemetery; a great botanist who utilized his knowledge not to put more drugs in the pharmacopoeia but by eliminating the useless ones to simplify the treatment of diseases most of which, given a chance, recover of themselves. And being an active practitioner universally respected and beloved, did he not do more for the public health than specialists in sanitation are likely to accomplish without the people back of them? We didn't know a century ago that the strumous diatheses of children were akin to tubercle, much less that they came from infected cow's milk. But this you have fully understood for nigh thirty years thanks to a man named Theobald Smith, and yet are only now taking steps to legislate against it.

"We had to fight the anti-dissectionists for the sake of anatomy, so why don't you for the sake of your modern physiology get a bill passed, as we did, permitting you to go on with animal experimentation unmolested? Do I understand that your pre-medical science teachers have had no experience at the bedside? If this is so, how can they be proper instructors of those who are to become worthy members of this ancient society?

"The public health officer is taking the place of the doctor, did I hear someone say, with this new slogan of preventive medicine? Yes, what's been done to lessen typhoid and malaria and yellow fever is all most creditable, but could he keep out cholera more successfully than we did; and what of these modern pestilences with the

long names—poliomyelitis, encephalitis and influenzal pneumonia of which I hear so much? If they cannot as yet be prevented, what then? Some doctor must care for those who are struck down by them.

"The worth of an ounce of prevention was an adage old even in my day. The longest period I was ever away from my practice was in the Spring of 1764 when, after making my will, I came here to be inoculated with smallpox virus by my friend Perkins who kept me in quarantine for twenty-nine days. I then went home and as a self-appointed health officer inoculated two hundred of my Salem people with only two fatalities, whereas two out of three were dying elsewhere from the scourge taken in the ordinary way. It was the proper thing to do; the people knew me and whether they liked it or not they took my word for it.

"But what this old-time inoculation might accomplish was a mere drop in the bucket to what Edward Jenner did single-handed, and he too a mere country doctor. No pestilence ever spread with the speed the news was carried round the world that smallpox need be no more. The dead tell no tales, but the pockmarked survivors were for all to see and they were once to be met at every turning in the lanes of Boston. All this, I fear, is forgotten with a movement now on foot to discredit vaccination and to rescind our hard-won laws. The natural way to combat such a movement is for his family doctor to say what is necessary in the legislator's home. But it would seem that a modern apartment with its victrola, its radio set and bridge table is incompatible with the idea of a home and a family life and a family doctor—the three safeguards of happiness and health.

"Does not your present-day boast that you have greatly increased the expectancy of life merely mean that there are going to be just so many more persons in the world growing old who some day will be in need of a common-sense practitioner to advise them how best to get along with their stiffening blood-vessels, their troublesome kidneys, their bronchitis and indigestion and diabetes and a thousand other things; and no less of a skillful surgeon to set their broken bones, remove their enlarged prostates, take out their tumors, cure their ruptures and what not—*ocyus, jucunde et tuto;* skillfully, sympathetically and safely? Are you, either in your older or newer school of medicine educating, and in the right way, the proper sort of people to be *our* successors and *yours* in work of this kind?

"There are specialists, I'm told, for every malady, for every age, for every viscus, for each and every orifice, to whom the people go; but how can they learn to whom to go, or whether to go at all, without the sage advice of a trusted general practitioner? Can the dependability and usefulness of these unostentatious public servants—dim figures, to be sure, in the background of history's canvas — ever be supplanted by anything better? Theirs was the broad and comprehensive view; your specialists are said to be persons who know more and more about less and less—very useful, to be sure, on occasions, but not always the safest persons first to consult.

"Those thirty-one men over whom I presided not so long ago had their strong differences of opinion but they shared the common ground of culture, knew their classics, and at the same time had been taught to write good English with a legible hand, even though they cut their own quills, mixed their own ink and made the best possible use of what hand-made paper was available. Can you do as well or do you merely talk your correspondence into a machine for someone, who corrects your grammar and who knows how to spell, subsequently to put through another machine onto machine-made paper?

"To be sure we knew little of chemistry. Medical chemistry was then in its antiphlogistic infancy; but even so, Lavoisier and Cavendish and Rutherford and Berthollet, not to speak of Humphry Davy and those Josephs—Black and Priestley—knew a thing or two. And after all, was not botany an equally good discipline? It at least afforded us a deal of pleasure on our country rounds, and took doctors to their gardens and orchards in their old age. Some of them, to be sure, like Samuel Philbrick, broke their necks of a Sunday morning pruning apple trees, but that's a more picturesque end than dropping dead on a golf course on the Sabbath. With all your synthetic drugs, what have you today to take the place of the bark, of opium, of foxglove and belladonna and ipecac—and I might add Jamaica rum? You still prescribe Dover's powder, I understand—and probably not enough of it.

"When we first came together to found this Society the population of Boston was estimated at 12,000 persons. It had increased to 60,000 in 1831, to over 300,000 in 1881; and today I'm told about 1,500,000 are crowded in your metropolitan area. At this rate, with a five-fold increase every fifty years, by the time of our two hundredth anniversary we may expect Greater Boston to have a population of some seven million. With the most perfect health organization conceivable, at least three or four times the present number of practicing doctors will be needed for this thriving place some of you will live to see.

"My own Alma Mater at present not only restricts the number of its matriculants for a medical degree but by pushing the entrance requirements back into college excludes from our guild many we would welcome into it. Having been slow to make up their minds they are now driven into business, which to salve our

conscience, we are elevating by the boot straps into a "profession". New schools—co-educational ones at that—are here and may teach us of the older school a lesson just as once did that flourishing school in the Berkshires. One of them bears the family name of my old friend Cotton Tufts of Weymouth, one of the secondary founders who never missed a meeting of this Society, and whose great-grandfather formerly owned the very acres of land on which Tufts College is built. And there is that other vigorous upstart, Boston University, with its thriving medical department which in another fifty years will be looked upon as one of the older schools. Will these three at the time of our bi-centenary be able to supply the necessary doctors for this community, or will other schools have to come into existence?

"Then, too, I'm puzzled not a little by these life extension examinations. It looks like a good thing for someone—not necessarily the patient. An insurance examiner after listening to the heart takes a specimen of urine and lets it go at that, well aware that it's often extraordinarily difficult to tell what's wrong with people who complain of some definite symptoms, let alone those who have none. I should think these periodic examinations with their tappings and probings and listenings and testings for something wrong would give apprehensive people what we used to call the vapours. Isn't expectancy of life after all pretty much a matter of heredity combined with decent living? To be sure, you keep a lot of children alive that would tearfully have been buried in my day. Sad enough. But isn't it better to have plenty to begin with rather than to teach people who ought to be having them how to escape the responsibility?

"From what I've glimpsed today of the folks who pass their time riding about with no apparent purpose in these horseless contraptions that crowd your broad thoroughfares, too many people of the wrong kind are kept going in your modern world. The able bodied ones, still able to walk across the street, are rapidly getting killed off; the weak and feeble are protected, survive and soon will be the only ones left to propagate the species. In my day it was just the reverse; only the vigorous survived to marry and beget children, any one of whom with plain food, hard work, good habits, an outdoor life and that form of morality which includes piety might be expected to keep going as long as I did—and that's long enough.

"But I've already said unnecessarily much—even for an old man and a back number. When I come again in 1981 we shall then see—what we shall see. Human nature being what it is, and having changed not at all since history began to be written, we may suppose that people will continue at odd times to get ill or get injured and as of old will need a doctor and will prefer one of their own personal selections. And it will still be the duty of some one to train for this express purpose the most likely, wholesome, intelligent and cultured young men we can attract into what will continue to be the greatest of the professions. God be with you."

With this benediction the old man with a bow departs from the hall, climbs into his one-horse gig, and at the street crossing, scorning that modern impediment to progress, the red light, disappears in the general direction of Salem.

THE EVOLUTION OF MODERN SURGERY*

BY ALEXANDER PRIMROSE, M.B.†

I AM fully conscious of the honour you have conferred upon me by asking me to deliver the Shattuck Lecture on this the one hundred and fiftieth anniversary of the founding of the Massachusetts Medical Society. As a Canadian and on behalf of my medical colleagues in Canada I offer you most hearty congratulations on the achievements of a century and a half. The close bond of friendship that exists in the medical profession between Canada and the United States was exemplified at Philadelphia last June when the Fellows of the American Surgical Association elected me to the President's Chair, a distinguished honour which I prize all the more highly because of the expression of international good will it implies. In my official capacity as President I have much pleasure in tendering the greetings and felicitations of the American Surgical Association.

The record of the Massachusetts Medical Society, which has now attained such a venerable age, is replete with conspicuous evidence of many activities undertaken and successfully accomplished for the practical solution of problems relating to human suffering. To appreciate its achievement one must look back to those who promoted it, for the ultimate success of any society is dependent primarily upon the character and aspirations of its founders.

An attempt was made to form a medical society in Massachusetts as early as 1765 when the so-called graph iatroon letter, by an unknown author, was circulated among practitioners of medicine. The letter set forth the high ideals of the promoters and was circulated with the utmost secrecy; it was recorded that it was "carefully sealed and superscribed lest a telltale wife or child should divulge". The attempt, however, was abortive. The country had passed through troublous times in this latter part of the 18th century. Many of the founders of the Society had taken part in military duties during the Revolutionary War. There is a tradition that one of these, Dr. John Warren, played an active part in a notable incident when three cargoes of tea were emptied into the harbour of Boston as a protest against the Tea Act of 1773. His brother was killed at the battle of Bunker Hill. So, too, other members of this group were active in their country's service, suffering hardship and privation for the attainment of patriotic ideals.

When peace was secured, however, men of strong character devoted themselves to reform society and among other activities there emerged a determined and successful effort to organize the medical profession. This effort was fostered by a group of the most eminent physicians in the commonwealth. They eventually became the founders (fourteen in all) of the Massachusetts Medical Society. The Act incorporating the Society was read for the first time in the Legislature on May 11, 1781.

The aims of the Society were set forth in a letter to the public by Dr. John Warren in these words, "To make a just discrimination between such as are duly educated and properly qualified for the duties thereof and those who may ignorantly and wickedly administer medicine, whereby the health and lives of many valuable individuals may be endangered and perhaps lost to the community". Within the first year or two of its incorporation, therefore, the Society was engaged in the licensing of practitioners of medicine in the State and an "irregular practitioner" was somewhat naïvely defined as "any person who is engaged in the practice of medicine and surgery in this commonwealth not being a fellow or licentiate of the Society nor a doctor in medicine of Harvard University". Reference is made to Harvard because that University had equal rights to confer licence to practise.

These rather narrow aims were, however, immediately widened. The Society, constituting the leaders of the profession, was ever in the van of medical progress. Among its early undertakings might be mentioned vaccination for smallpox in 1800, a crusade against tuberculosis, the care of the insane, the preservation of public health, provision for addicts to alcohol and narcotics, and the free distribution of antitoxin and vaccine.

The founders of the Massachusetts Medical Society were men of great strength of character and remarkable vision with a fixed determination, by the exercise of reason and judgment, to reduce order from chaos, to distinguish between the false and the true, and to establish for medicine an organized society capable of rendering service to the community with ever increasing efficiency. The foundations were well and truly laid and have stood the ravages of time. Upon these foundations in the intervening years a superstructure has been reared that embodies in its progressive development many additions to the work and pursuits of the Society. This evergrowing activity was rendered necessary by the advance of modern medicine. The organization of the medical profession for effective duty was an important contribution to the development of the social life of the community as a whole. One might assume that the promoters were guided by some such principle

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as that laid down by Marcus Aurelius when he wrote:—

> "First do nothing inconsiderately, nor without a purpose,
> Second make thy acts refer to nothing else than to a social end."

From the earliest days of its existence the Society recognized that a library was an essential part of its equipment. The first librarian, Aaron Dexter, appointed in 1782, kept the books in his own house. As early as 1783, it is recorded, books and pamphlets were presented to the Society. An eminent predecessor and fellow-countryman of mine, Sir William Osler, when delivering a lecture in this city on the opening of the new home of the Boston Medical Library said in his characteristic direct fashion, "To study the phenomena of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all".

The founders of the Society were men learned in the humanities, in whom the love of books was inculcated at an early age, and we are not surprised to find them insisting on a library as indispensable for their progress. We may get some impression of the educational standards of these men when we read of an official function at Harvard in 1788 when the first men for graduation in medicine were presented; the ceremonies which were opened by prayers included a Latin oration by the President and were closed with the singing of psalms. When a new Act was prepared reorganizing the Society in 1803, Dr. John Dexter Treadwell drew the bill and as one of his credentials it is stated he was "versed in the Greek and Hebrew scriptures". Then again among the requirements from those who presented themselves for the examination for licence (1789) we find that the candidate must be "able to construe and translate both Latin and Greek". The examination also included an accurate knowledge of the English language and the rudiments of Natural Philosophy. Unfortunately a classical education is no longer regarded as a necessary requirement for licence to practise medicine. Few men in the profession today can construe Horace or write Greek verse; yet there are exceptions; for example, one of my surgical colleagues during the War, the late Dr. John Malloch, in the University Tent Hospital at Salonica, found keen pleasure and profit as well as recreation in translating Hippocrates from the original. It is interesting to observe that in the transactions of the Pathological Society of London it was the custom to precede each paper by a summary in Latin. This custom was continued until the Society went out of existence in 1908 when it merged with the Royal Society of Medicine. Those of us who have not had the advantage of an education in the classics are handicapped because we lack the training that such studies provide regarding the fundamental principles upon which human society is founded. In the practice of medicine we are perforce students of human nature in its manifold manifestations and our ability to solve our daily problems is greatly enhanced by the character of our preliminary education and the incentive it may give for the pursuit of cultural study throughout our professional life. "A physician," says Osler, "may possess the science of Harvey and the art of Sydenham, and yet there may be lacking in him those finer qualities of heart and head which count for so much in life".

In an ideal community are to be found leaders who are capable of initiating or at all events of utilizing advances in science for the progress of medicine. As an example let us note certain members of this Society who were pioneers in the surgical field. Dr. James Lloyd was the first surgeon in America to use ligatures as a substitute for the searing of wounds with the actual cautery to check bleeding. Dr. John Warren performed one of the first abdominal sections recorded in the country. His son, Dr. John Collins Warren, famous in the history of medicine for the part he played in the introduction of ether anaesthesia, was an able surgeon. He was the first in America to operate for strangulated hernia and he introduced the operation for aneurysm by Hunter's method. Dr. George Hayward performed the first major operation under ether when he amputated a thigh. The operation was completed in a minute and three-quarters, exclusive of tying the vessels. Later, in 1856, Dr. George H. Lyman read a paper on the history and statistics of ovariotomy. Dr. Henry Ingersoll Bowditch introduced the method of tapping the chest for pleural effusion and was criticized by one of his colleagues who said he would as soon shoot a bullet into the chest wall! Of recent years the Society has taken an active part in the campaign against cancer. From the earliest days of its existence the Society has possessed among its members men who were in the forefront of surgical progress.

We may now take a broader view of the field of surgery and examine the series of events from which were evolved modern methods in the practice of our art. The two outstanding events that gave impetus to advance in modern surgery were the introduction of anaesthetics in 1846 and, two decades later, the enunciation of the principles of antisepsis. These two epoch-making discoveries were the necessary forerunners of the remarkable achievements that today in the surgical field provide relief for human suffering and effect a cure of many maladies that in earlier days were considered hopeless.

The pain endured by those unfortunates who had to submit to a surgical operation before the days of anaesthesia must have made the stoutest heart quail. No wonder a surgeon who could

perform an amputation of the thigh in a minute and three-quarters attained merit because of the speed with which he could release his patient from suffering. Speed is no longer a prime factor in surgical procedures. As a fact under anaesthesia the surgeon now does his work with precision and deliberation; relieved of the necessity for haste, he can exercise calm judgment at each step. He can handle the living tissues with the utmost gentleness and delicacy of touch while the patient is unconscious of the slightest distress.

ANAESTHETICS

From ancient days attempts have been made to relieve pain during surgical operations. Dioscorides and Pliny refer to the use of mandragora (mandrake) to prevent pain in such circumstances. For similar purposes Hugo de Lucca used this drug in the thirteenth century. A reference is made to it more than once in Shakespeare. Iago addresses Othello thus:—

> "Not Poppy, nor mandragora,
> Nor all the drowsy syrups of the world,
> Shall ever medicine thee to that sweet sleep."
>
> (Othello, Act III, scene III.)

A Chinese physician, Hoa-tho, used hemp to render patients unconscious during surgical operations in the third century. Sir Humphrey Davy in 1800 suggested the use of nitrous oxide gas as an anaesthetic in surgery, having discovered in his own person that it relieved local pain, and Michael Faraday demonstrated the anaesthetic effects of ether in 1818. This suggestion of surgical anaesthesia remained unheeded for nearly half a century.

A number of American physicians had discovered the anaesthetic properties of ether in the early part of last century, Godman in 1822, Jackson in 1833, Wood and Bache in 1834; while Long of Jefferson, Georgia, removed a tumour of the neck under ether in 1842 and advertised its use in these words "Ether with operation cost two dollars and ether without operation twenty-five cents". (Libby.) Then Horace Wells, a dentist, extracted teeth under ether in 1844.

It remained, however, for Morton, also a dentist, to demonstrate the full value of ether as a general anaesthetic for surgical procedure in 1846. The scene was set in the Massachusetts General Hospital. Dr. J. C. Warren, a distinguished surgeon of the day, had arranged that Morton should administer the drug on October 16, 1846, to a patient about to be operated upon. Morton kept the name of this drug secret and called it "lethon". The experiment was wholly successful, a tumour was removed from a man's neck without pain; Warren, who had been sceptical, turned to those present and remarked, "Gentlemen, this is no humbug". This initial demonstration was followed by others in rapid succession. George Hayward, a colleague of Warren, performed a second operation under ether the following day and on November 7, 1846, he did the first major operation under ether when he amputated a thigh.

Immediately after Morton had introduced ether anaesthesia in the Massachusetts General Hospital, the discovery was publicly announced, mainly through the efforts of Henry J. Bigelow, and the boon of surgical anaesthesia was published to the world.

The scene now shifts to Edinburgh where Sir James Y. Simpson, the professor of midwifery, hearing of the value of ether anaesthesia and being impressed with the success of Liston, who performed the first major surgical operation under ether in England at the University College Hospital, London, in 1846, began to look for other anaesthetics and discovered chloroform. Simpson and a number of his colleagues inhaled chloroform in his dining room until the entire party disappeared under the table in various stages of unconsciousness. The experiment was pronounced a complete success and Simpson became the apostle of surgical anaesthesia in Scotland. He was the first to administer an anaesthetic in obstetric cases. In Scotland he encountered much opposition. The theologians took a hand in the controversy. They proclaimed from the pulpit that pain was a punishment to be borne in the spirit of meekness; it was part of the primeval curse pronounced on woman; the administration of anaesthetics was an impious attempt to thwart the divine will. Scripture was quoted freely in support of these arguments. But Simpson used the same weapon in his defence when he said, "My opponents forget the twenty-first verse of the second chapter of Genesis; it is the record of the first surgical operation ever performed, and that text proves that the Maker of the universe, before he took the rib from Adam's side for the creation of Eve, caused a deep sleep to fall upon Adam". The dispute was no "tempest in a teapot". It has been described as "the angriest and most widespread controversy of his time". Eventually Simpson triumphed, all opposition broke down. This happy event was hastened when Queen Victoria permitted the use of chloroform at the time Prince Leopold was born in 1853.

After the lapse of half a century general anaesthesia was followed by local anaesthesia. Bier first induced spinal anaesthesia in 1898, using cocaine for the purpose; this was subsequently replaced by stovaine, a substance first discovered by Fourneau in 1904, and later by novocaine. The technique of spinal anaesthesia has been greatly improved. Many of us regard it today as ideal concerning both the safety of the patient and the marked advantage it provides in greater relaxation of the tissues, more particularly in abdominal and thoracic surgery. The "block" method of inducing local anaes-

thesia with its various modifications is a more recent development. Then again for the production of general anaesthesia rendering the patient unconscious we have not only the ordinary inhalation method by the mouth but such variants as rectal anaesthesia and the intratracheal form of administration.

Scientific research is constantly adding to the sum of human knowledge. Problems are solved in the laboratory or the clinic that are far-reaching in their effect upon future progress. It is impossible to determine the full value of the discovery and establishment of scientific truth concerning any one problem. Thus the introduction of general anaesthesia by Morton paved the way for advancement in surgery in a manner impossible of achievement if the pain of operative procedures had not been abolished. It is eminently true also regarding the introduction of antiseptics by Lister. We propose now to examine this second great advance in the evolution of modern surgery.

ANTISEPSIS

Putrefaction in animal tissues is due to the activities of microscopic organisms that we call bacteria. Long before this scientific fact was established, efforts were made to prevent putrefaction by empirical methods with varying success.

It is interesting to observe that among certain animals there is apparently a natural instinct to prevent putrefaction. Thus Mr. Wellcombe tells us of certain incidents in the life of the bee. "Should an intruder, in the form of an insect or moth, make its way into the beehive, it is speedily killed and ejected. Should, however, this be impracticable, owing to its position or size, the body of the intruder is impregnated with, and preserved by, the formic acid secretion of the sting and putrefaction thereby prevented. It is then methodically and hermetically enclosed in a sepulchre of wax, so that, it being excluded from the air, the bees are protected from septic influences." Should a snail find its way into the hive the orifice of the shell is promptly sealed with wax so that the intruder is entombed therein and the danger of contaminating the hive prevented. Many birds dress their wounds in an ingenious manner so as to exclude air and promote healing. We are all familiar with the manner in which an animal, such as the dog, will lick its wounds, thus cleansing them and probably adding some antiseptic influence from the saliva. We are told that in the temple of Aesculapius at Epidaurus, sacred serpents were kept for the purpose of licking the wounds of those who sought succour.

Putrefaction will not occur in the absence of moisture. Hence from earliest times we learn of foodstuffs being preserved by drying. This process is still employed at the present day, more particularly in the drying of fish. Prevention of putrefaction by smoking is a method which has also come down to us from the early ages. It is said that the antiseptic action of creosote, present in the smoke from the wood, is the preservative agent. So, too, the use of natural salts to preserve food is of ancient origin and is utilized extensively today. The ancient Egyptians embalmed their dead by immersing the body in brine, adding as accessories various aromatic substances and resin. It is believed the chief factor in the success they attained was the natural dry climate of the country. We are told that honey was used for embalming purposes before the Christian era. Thus the body of Alexander the Great was embalmed in honey.

The Greeks and Romans used certain herbs and medicinal plants in the treatment of wounds. Thus "Virgil describes how Diana, moved with pity at the sight of the sufferings of the son of Theseus, who was torn by his own horses, healed his wounds by the aid of certain medicinal plants". (Wellcome.) Hippocrates taught that wounds should be kept dry and advocated the use of certain substances including turpentine, vinegar, etc., which undoubtedly possessed antiseptic qualities. Pitch and other tarry substances were also employed by the ancient Greeks for similar purposes. You will recall also that in the scripture story the Good Samaritan poured in oil and wine to heal the wounds of the man by the wayside.

In the eleventh century Albucasis, an Arabian surgeon, recognized the importance of excluding air from wounds. The school of Salerno advocated certain substances as a surgical dressing, including aloes, centaury, galls, fennel flowers, etc. The Anglo-Saxons used honey as a dressing for wounds. Guy de Chauliac in the fourteenth century employed hot red wine in their treatment. Ambroise Paré experimented with numerous substances for the dressing of wounds and attained varying success with many that possessed antiseptic potency.

W. B. Howell gives an interesting account of the use of "sympathetic powders" in the seventeenth century. One Sir Kenelm Digby, a member of the Royal Society, published a book on the subject. The case is narrated of a man wounded in the hand during the progress of a duel. The wound was bound up by one of the combatants who used his garter for the purpose. Plasters were applied but the hand became swollen and painful. Digby took the garter from the hand and put it in water in which he had dissolved some of his sympathetic powder. No sooner was this done than the injured man who was standing apart, perceived that he was relieved of pain. Digby then directed him to throw away the plasters and keep the wound clean. The garter was subsequently dried before the fire whereupon the wounded man sent his servant in hot haste to Digby because the pain had returned, as bad as ever. Digby then

once more immersed the garter in the solution of sympathetic powder and the pain was instantly relieved! The powder in reality was copper sulphate. The only value of the treatment was undoubtedly due to the circumstance that the irritating plaster was removed, the wound was kept clean, and healing took place by natural processes.

A Dutch physician Antonj van Leeuwenhoek (1632-1723) has been described as the first of the microbe hunters. He manufactured lenses and through his primitive microscope he discovered the existence of living microörganisms in contaminated water.

Spallanzani an Italian priest (1729-1799) confirmed the discovery of microbes by Leeuwenhoek and was the first to observe that these minute organisms multiplied by fission thus dealing a fatal blow to the false doctrine of spontaneous generation which was popular at the time. Needham in 1745 demonstrated the fact that if putrescible substances were first heated to a sufficiently high temperature and then excluded from the air, putrefaction could be postponed indefinitely.

The study of folklore is instructive and of great interest. We sometimes find that traditional beliefs result in a form of empiricism that seems to sense in some unconscious fashion the fundamental principles that govern the processes of nature. This was illustrated in the activities of a peasant woman in the village of Ayr, a small village in Western Ontario. "Aunt Anderson", as she was called, had remarkable success in the treatment of serious and extensive wounds because her method, crude though it might be, was in reality, all unknown to her, a process of sterilization. She and her forbears came from a country village in the south of Scotland and the special form of treatment she employed had been handed down from one generation to another in her family. The materials used were boiling water and "clouts", the latter consisting of a number of strips of cotton tied together in a bundle. Dr. Wm. Goldie of Toronto, when a small child in Ayr, about 1878, saw Aunt Anderson treat a compound fracture of the leg; and it is from him I have the following account: An accident had happened in a nearby mill, a fertile source of opportunities for the exercise of the woman's skill, and Goldie, too small to walk all the way to the mill yet unsafe to be left alone at home, was carried by his people to the field of operation where he was stowed in a high chair from which point of vantage he made his unsuspected observations.

The victim of the compound fracture was brought into the kitchen and the injured limb was laid bare with the broken fragments of both bones protruding through the skin. Aunt Anderson then called for the clouts which were kept in readiness for such emergencies. These were placed in a large boiler filled with water on the kitchen stove. When the water was merrily boiling Aunt Anderson would fish out one clout after another and wring it out, dropping each back again only to seize another for the same treatment. Her hands naturally became sodden and somewhat resembled raw beef as she proceeded. Incidentally they were thoroughly sterilized. Then she turned her attention to the injured limb. A clout was wrung out and placed upon the seat of injury, the poor victim writhing in agony. This was repeated many times until the limb was now clean and reddened by the increased blood supply occasioned by the heat. "For," said Aunt Anderson, "it winna' heal gin we dinna' bring the blude intill't." Having sterilized the limb she now manipulated the bones into position by introducing her sterilized fingers into the wound. This done, with the aid of some sturdy assistant who pulled vigorously on the man's foot, the boot well laced being still retained, she applied a splint and secured the limb thereto by suitable bandages, leaving the seat of injury exposed. Subsequently the hot clouts were applied until the wound was healed. After each application of the clouts the wound was sealed by a dressing composed of charred bread and cornstarch taken directly from the frying pan. It is said that Aunt Anderson never lost a compound fracture during her professional career and attained such a reputation for successful practice that the regular practitioners of the village could not compete with her. The principles enunciated by Lister in his antiseptic treatment of wounds could hardly be more thoroughly observed. Call it intuition if you like; it is merely another example of purposeful empiricism—some apprehension of the mind without intelligent reasoning.

For many centuries there had been an inkling of the truth regarding the contamination of wounds by some form of poison. It was suspected that the process of wound infection bore some analogy to the process of putrefaction. The exclusion of air, had, in some manner, a beneficial effect in preventing or controlling it. The application of certain substances to wounds appeared to mitigate the deleterious influence of some unknown agency that prevented or retarded the healing process. It was a theory based upon observation but lacking any scientific proof of cause and effect. Bassi in 1835 came near to the truth when he stated his belief that the disease in silkworms was due to a parasite that could be killed by certain substances and asserted that in his opinion in similar fashion contagious diseases could be cured by destroying the animal or vegetable organisms that produced them. Treatment of wounds, however, was purely empirical. Benefit was derived from certain methods of treatment and ingenious theories were formed; but these were not based on actual scientific discovery. It remained for

Lister, utilizing the discoveries of Pasteur, to employ a method of treating wounds based upon established facts regarding infection which revolutionized surgery. The antiseptic method introduced by him paved the way for and made possible the remarkable achievements of modern surgery. It has been tersely said that there are two epochs in the history of surgery, namely before Lister and after.

What then was this epoch-making contribution of Lister to the evolution of modern surgery? It is an oft-told tale, Lister's splendid fight to establish the truth; yet it forms one of the most fascinating stories in the history of medical science. Briefly it may be stated as follows:—

Prior to 1865 Lister practised surgery under adverse conditions; pyaemia, erysipelas and hospital gangrene demanded a terrible toll of human lives in the surgical wards in which he worked—a condition which he describes as "sickening and heartrending". This distressing condition existed in all large hospitals at that time. For some years he studied inflammation and wound infection and he had concluded that suppuration was in some way produced through the agency of the air. In 1865 his attention was called to the discoveries of Louis Pasteur, a celebrated French chemist. Pasteur had shown that putrefaction was a fermentation produced by the growth of minute microscopic living organisms that were carried far and wide by dust floating in the air. Lister recognized the significance of this discovery and saw that it was the key to solve his problem regarding wound infection. By the use of antiseptic substances, such as carbolic acid, he found he was able to control and prevent infection in wounds. Ere long he formulated the principles of the antiseptic treatment of wounds, and the so-called microbic or germ theory of infection became one of the earliest contributions to the science of bacteriology, a science which was destined to advance with prodigious strides in subsequent years. Thus Recklinghausen found micrococci in erysipelas, Obermeier a spirilla in relapsing fever, Klein bacteria in enteric fever and Koch the bacillus of tubercle. In recent years it has been demonstrated that many other diseases are caused by specific organisms.

Prejudice and ignorance will often impede or prevent progress. Lister encountered fierce opposition to his views. This opposition had its genesis in an attitude of mind so well described by Sir Walter Scott in "Old Mortality" regarding the introduction of fanners to separate the chaff from the corn; which displaced the ancient method of tossing the corn in the air upon broad shovels. Headrigg reproved Lady Bellenden for allowing the new process to be used on her farm "thus impiously thwarting the will of Divine Providence by raising a wind for your leddyship's ain particular use by human art, instead of soliciting it by prayer or waiting patiently for whatever dispensation of wind Providence was pleased to send upon the sheeling hill". The psychology of the situation was similar to that which we have already noted as responsible for the antagonism encountered by Simpson in the introduction of anaesthesia into Scotland.

It is a painful reflection to recall that Lister met the most bitter antagonism from his own colleagues and from many leaders of the profession of his day. Perhaps these leaders thought they were exercising the virtue of prudence in refusing to accept such revolutionary ideas. "Prudence," says Blake, "is a rich ugly old maid wooed by incapacity".

Savory, President of the Royal College of Surgeons, in 1879 in his address on surgery before the British Medical Association, places himself on record as opposed to the theories enunciated by Lister. It may be supposed that little assistance in the fight against infection could be expected from Savory when we find him stating that no mischief of this kind lurks in fresh healthy pus. He treated his wounds with tepid water and recommended bread poultices. He says, "A well made bread poultice preserves ample and equable warmth; it is everywhere very soft and adapts itself with singular uniformity to all irregularities of surface". Savory, however, used permanganate of potash at times in his wounds, and we find Spence in Edinburgh in his lectures on surgery published in 1882 advocating the use of tincture of iodine on his amputation flaps. These two, like many other prominent surgeons who opposed Lister, employed antiseptics in an empirical fashion and doubtless their results were the better for it.

The results in surgery at this time were appalling. In St. George's Hospital one-fourth of the compound fractures of the leg were fatal. In nineteen cases of ovariotomy there were thirteen deaths.

Eventually after a prolonged struggle Lister succeeded in establishing the truth of his theories of wound infection and of the efficacy of his antiseptic system in preventing it. He found he was now able to undertake operations hitherto unjustifiable and some of his experiences, in the light of our present-day knowledge, were grotesque. Thus it is related that on proposing to open a kneejoint for a plastic operation he was threatened with a suit for manslaughter should the patient die of infection. The field of surgery at that time was greatly restricted; the abdominal cavity was almost never opened except for the operation, then rare, of ovariotomy; the word "appendicitis" was not even coined and according to my senior colleague in surgery in Toronto should never have been coined as its etymology is incorrect. Not only in the case of the appendix but in that of all other abdomi-

nal organs and in various regions of the body the advance in surgery has been by leaps and bounds since the introduction of Lister's methods. Since the first removal of a tumour of the brain by MacEwan in 1883 and the subsequent development of operative technique in the surgery of the brain, primarily through the genius of Horsley, an enormous amount of successful work in this field has been accomplished.

Erichsen, a prominent surgeon in England and one under whom Lister had served as house-surgeon in University College Hospital 1850-1851, believed that a finality had then been reached in the fields that might be invaded by the surgeon. In an introductory address delivered in 1873 at the opening of the session of a large metropolitan hospital he speaks as follows:— "The art of surgery, like all other manipulative, plastic, or imitative arts, can only be carried to a certain point of excellence. That we have nearly, if not quite, reached the final limit, there can be little question. When we reflect that every large artery up to the aorta itself has been ligatured, that the amputation of each limb up to the shoulder and hip joints is a matter of ordinary occurrence, that large tumours having the most intricate anatomical connexions have been removed from every surgical region of the body, from the base of the brain to the lowest organ of the pelvic cavity, we can scarcely believe that much remains for the daring of the boldest to devise or the skill of the most dexterous to accomplish, in the extension of operative surgery." Let it be noted that when these words were written Lister had already demonstrated the value of his antiseptic method in surgery.

Today we recognize no finality in the progress of surgery. The difficulty is to keep pace with the advances made in many fields of surgical achievement. Every region of the human body is now explored by the surgeon for the relief of disease or trauma. It may be true as Lord Moynihan has recently averred that "the craft of surgery has in truth nearly reached its limit in respect both of range and safety", and yet experience has taught us that as fresh discoveries are made by the physiologist, the anatomist, the pathologist and the bio-chemist, new avenues of approach are opened up for the solution of the problems facing the surgeon. As we increase our knowledge of living tissue, both from the functional and morphological standpoint, we ever find it necessary to modify or completely revise our methods of surgical attack. Thus the process of evolution in surgical procedure must continue *pari passu* with advances in the ancillary sciences.

In this city you have exemplified the evolution of modern surgery in a region of the body that until very recent times was considered impossible of approach by the surgeon. I refer to the splendid achievement of Dr. Harvey Cushing in the surgery of the brain and spinal cord. Dr. Cushing and his pupils are today performing operations, more particularly in the eradication of tumours of the brain and its meninges, that command our greatest admiration. It is impossible to overestimate the value of this epoch-making contribution to surgery in bringing relief to those suffering from maladies hitherto considered hopeless.

We have another example of the evolution of modern surgery, again in the neurological field, in its application to the sympathetic nervous system. This was based primarily upon the contributions to our knowledge of the autonomic nervous system as demonstrated by Müller, Claude, Bernard, Gaskell, De Boer, and others. It is owing, however, to the brilliant experimental work of Hunter and the surgical genius of Royle, two colleagues working together in Sydney, N. S. W., that this very recent contribution to the surgery of the sympathetic nervous system has been made available. The operation of sympathetic ramisection was introduced by Royle as recently as 1923. He told us at the meeting of the British Medical Association at Winnipeg last August that he had performed the operation six hundred times with three deaths. The operation was originally done by him for relief of spastic paralysis. More recently it has proved of value in Hirschsprung's disease, in Raynaud's and Buerger's diseases, in retinitis pigmentosa and other conditions. Today the world over surgeons are performing this operation with success in the relief of many conditions. The limitations and the sphere of usefulness of this brilliant contribution to surgery are by no means yet defined.

We may further refer to the surgery of the thoracic viscera—the heart and lungs. Wounds of the heart have been closed successfully and foreign bodies have been removed. The lungs have been operated upon to remove tumour growth or a lobe has been removed for bronchiectasis. During the past two years my colleagues, Drs. Shenstone and Janes, have performed eleven one-stage lobectomies for bronchiectasis. In seven of these the lower lobe alone was removed, in three the right lower and middle lobes were excised and in one the left lower and part of the left upper lobe were resected. Two of the cases died five days after operation from septic pneumonia; the others have made good recoveries. The operation upon the last six cases was performed under spinal anaesthesia. This is a surgical achievement of no mean merit.

This remarkable progress in surgery would have been impossible if the principles enunciated by Lister had not been applied in surgical procedures. The victims of disease and trauma are relieved by surgical means as never before. The saving of life in the treatment of wounds

during the great war was infinitely greater than it would have been if the methods inaugurated by him had not been employed. Little wonder that Lister is described as one of the greatest benefactors of mankind. His claim to fame in this regard is recognized the world over. Perhaps one of the most notable tributes enjoyed by this great man was at the International Medical Congress at Amsterdam, at which he gave an address replying to various objections made to the antiseptic system—"he was received", as the *British Medical Journal* reported, "by the whole Congress with an enthusiasm which knew no bounds. When he stepped forward to the desk to open his address (which was delivered with but few notes in improvised French) the whole assembly rose to their feet . . . with deafening and repeated rounds of cheering and waving of handkerchiefs. This was continued for some minutes until Professor Donders . . . taking Lister by the hand said, 'Professor Lister, it is not only our admiration which we offer you, it is our gratitude and that of the nations to which we belong.' "

THREE EPOCHS IN MEDICAL HISTORY

A study of the history of medicine from the earliest times affords us an opportunity of forming an intelligent conception of the factors which made for progress in the past. We can account also for the greatest developments of recent times and we may view with enthusiasm the prospect for the future. From the time of Hippocrates (300 B.C.) to that of Galen (130-201 A.D.) great strides were made in the progress of medicine. The word "physician" is derived from the Greek word meaning nature and physicians were thus first called naturalists. Aristotle (384-322 B.C.) the son of a physician was the most outstanding scientist of his day; in his youth he is said to have had a bias for medicine and biology. This remarkable man has made his influence felt all through the ages, more particularly as a naturalist. We cannot illustrate this fact better than by quoting an observation made by Darwin when he compared the accomplishments of Aristotle with those of two famous eighteenth century naturalists. Darwin says: "From quotations I had seen I had a high notion of Aristotle's merits, but I had not the most remote notion what a wonderful man he was. Linnaeus and Cuvier have been my two gods, though in very different ways, but they were mere school boys to old Aristotle."

The scientific achievement of those early days was truly remarkable. The scientist observed the processes of nature and progress was made when the observation was accurate. In fact in this epoch accuracy of observation was practically the sole avenue of approach to progress in medicine. The inductive method was adopted to establish theory. Many times the theory although erroneous held sway until some more accurate observer corrected the error. The authority of Galen was established so firmly in the minds of the ancients that to challenge it was almost considered sacrilege. His teaching was often erroneous in human anatomy because he based his views largely on observations made in dissecting the lower animals. Fourteen centuries elapsed before Vesalius, braving the fierce antagonism of contemporary critics, established the facts of human anatomy in the sixteenth century. Vesalius was accurate in his observations and hence his contentions were unassailable. After the fall of the Roman Empire, the world was plunged back into a condition of intellectual lethargy and superstition. For many generations the lamp of science burned low. It was not until the fifteenth and sixteenth centuries that progress again became apparent in the work of such men as Leonardo da Vinci and Vesalius.

An example of the credulity of the public and the superstition that existed in the middle ages is found in the interesting ceremony of the Royal Touch for scrofula which was in vogue from the eleventh to the end of the eighteenth century.

In the fifteenth century Edward IV introduced the custom of presenting the patient with a golden coin, "the angel", valued at six shillings and eight pence. This custom has been attributed not solely to the desire to assist the destitute but in addition to the wish to popularize a practice that stamped the Royal Personage as the Lord's anointed. These angels were so called because of the figure, on the obverse, of the archangel Michael piercing the dragon. They passed as current coin and would appear to have been used in particular for the payment of physicians' fees. One quaint old herbalist has a jibe at physicians regarding the angel when he says that, "like Balaam's ass, they will not speak till they have seen an angel". (Crawfurd.) Curiously enough the value of the angel, six shillings and eight pence, is the legal tariff paid lawyers for letters in England today. We have been unable to trace the connection; possibly lawyers in England were attempting to curry favour with the angels rather than with their legendary associates! The success of the Royal Touch for King's Evil was doubtless due to the fact that the patient was rescued from the drastic treatment prescribed by physicians of the time consisting of strong catharties, the use of escharotics and irritating medications and plasters, occasionally a poultice consisting of sheep's dung mixed with honey. These treatments were abandoned in favour of the Royal Touch and the patient got a chance to recover and did recover through the agency of the *vis medicatrix naturae*. As Ambroise Paré was accustomed to put it quaintly, at the end of his clinical record of a successful case, "I dressed him and God healed him." The same idea was expressed by a well-known surgeon in

England towards the end of the last century, who chose as a motto for his book on surgery, "wounds have an insuperable tendency to heal".

Up to the sixteenth century we have an epoch of scientific development in which advances were made solely by accuracy of observation. A second period was inaugurated by Harvey (1578-1657) when he introduced the experimental method. Thus to accuracy of observation was added experiment. We are all familiar with his experiments on the deer in Richmond Park, carried out by Royal assent. He demonstrated the principles that led to the discovery of the circulation of the blood, a discovery which made his name immortal. In the eighteenth century John Hunter was an indefatigable worker, not only in the field of human and comparative anatomy but as an experimental biologist. He, like Harvey, had the Royal assent to experiment on the deer in the Royal Parks. The account of his discovery of the anastomotic circulation, when tying the artery that supplied the velvet of the antler and observing the subsequent result, reads like a romance.

In succeeding centuries experiments went hand in hand with accuracy of observation, resulting in great advances in scientific medicine—Jenner, Morgagni, Bichat, Laënnec, Charles Bell, Magendi, Johannes Mueller, Claude Bernard, Virchow and many others made accurate observations in experimental research. Their contributions to scientific medicine did much to eradicate error and to establish truth. By their discoveries of the processes of nature they laid a foundation upon which further advances were made possible.

A third epoch emerges when advances in scientific medicine were inaugurated by utilizing and applying discoveries in abstract science in the elucidation of problems of disease. An outstanding example is found in the life and work of Lister. We have already told the story of his successful effort to combat the high postoperative mortality from erysipelas, pyaemia and hospital gangrene which obtained in the wards when he first began to practice surgery. Lister was able to grasp and utilize the value of Pasteur's observations in the elucidation of his own problems concerning suppuration in wounds. As a fact Lister was, like Pasteur, a trained chemist and biologist and had already made a long series of researches by the study of tissues under the microscope. In this respect his training was of a type quite unusual among the surgeons of his day. His training, however, fitted him to utilize discoveries in abstract science and so Pasteur's discovery gave him the key by means of which he solved his own clinical problems. Thus Lister initiated a revolution in surgical practice, epoch making indeed and as we have said an essential step in the subsequent remarkable advances that have been made in surgery in the last half century.

The acceptance of new doctrines is accomplished only when individuals are capable of assaying their value and proving their truth. Lister's colleagues, in the main, lacked the necessary training in chemistry and in the fundamental principles of biology and physiology to prove or disprove the theories advanced by him. Hence the general acceptance of the scientific proof upon which he based his principles and practice of antiseptic surgery was postponed for a quarter of a century. The utilization of one of the greatest boons ever conferred upon humanity was retarded because the profession was not sufficiently educated to grasp its significance.

Let us apply these facts to the consideration of medical education today. The graduate of our University in Medicine is trained in the fundamental sciences; he is taught to observe accurately and to make his deduction from such observations; he is required to apply the experimental method in elucidating clinical problems; and he is made capable of applying the discoveries of abstract science in the treatment of disease. The effect of such training is in the main twofold. First a limited class, with the necessary training and initiative, is able to carry on problems of research and to further the advance of modern medicine. Secondly the graduate of today, so trained, has a receptive quality that enables him to assess the value of scientific research and to apply it in his practice. Had Lister's colleagues possessed this educated receptivity the acceptance of his discovery would not have been postponed for 25 years. We have many examples of the results that are attained in our own day which are in marked contrast with those of Lister's time. Thus in the University of Toronto we have insulin which was discovered by utilizing the methods of scientific investigation. Today such a discovery is not only tested in numerous laboratories throughout the world but the practitioner is so trained that he can assess the value of the discovery and apply it in his practice. By this means insulin, one of the most beneficent contributions to medical practice, was made immediately available in the treatment of suffering humanity.

We have of necessity said much of Lister in tracing the evolution of modern surgery. It is not out of place to refer to the personality of the man who accomplished so much for the good of humanity. It is well for us to emulate his idealism. The writer after graduation had the privilege of visiting Lister's wards in King's College Hospital and of seeing him at work. The casual visitor could not fail to be impressed by his attitude of gravity and serious concentration as he proceeded with his work at the operating table or in the wards. The guiding principle of his life and work was the sentiment expressed by Novalis, an eighteenth century philosopher, when he said, "You touch God when you lay your hand upon a human body," or as an old and esteemed friend, the Nestor of the medical profession in Canada, John Stewart, paraphrased it, "The spark of life we tend is a part of the divine—and immortal."

OBSERVATIONS ON SPINAL ANESTHESIA WITH A REPORT OF 1875 CASES

BY BORIS RAPOPORT, M.D.*

ABOUT three and a half years ago I reported five hundred cases of spinal anesthesia which had been successfully performed by me without a single death[1]. Until that time spinal anesthesia had been practiced in only few places and the number of cases reported were few. The procedure was very seldom employed as the anesthetic of choice, and only with considerable apprehension was it used in operations upon the upper abdomen. Since that time, however, the progress of spinal anesthesia has made such rapid strides that at present it is the preferred anesthetic in many upper as well as lower abdominal operations.

During the last thirty-five years experiments have been carried out by Croning, Bier, Babcock, and others with the object of securing a safe and efficient drug for this purpose. Solutions of various specific gravities had been employed to obtain an anesthesia which could be limited to different levels of the human body according to the operation in view. About three years ago spinocain came in vogue and for a short time it was thought that this preparation was going to revolutionize the practice of spinal anesthesia. The use of spinocain, however, as advocated by Pitkin[2] has failed to live up to expectations. Localization of the area anesthetized has been subject to wide variations, and at times dangerous complications have ensued.

Spinal anesthesia as practiced at the present time is much safer than it was five years ago. Among the chief factors contributing to this safety are: the use of a small gauge lumbar puncture needle, the conservation of the spinal fluid (the old method was to discard 5 to 15 c.c.) the employment of ephedrine preliminary to the induction of anesthesia, and the practice of putting the patient in Trendelenburg's rather than in Fowler's position.

There is nothing so instructive to the anesthetist as careful observations made during operations of the action of the patient under spinal anesthesia. In this way he is able to secure a working knowledge regarding the dose and technic best suited for certain patients under given circumstances. He is also able to familiarize himself with the different methods of avoiding undesirable reactions and the best ways of combating them should they occur.

Of the more severe operations in my series, 94 were performed upon the gall bladder, 55 upon the stomach, 83 upon the kidney, 43 Caesarians, 36 cases of obstruction of the bowels, 4 on the liver, and 83 hysterectomies. Among the less severe operations were many prostatectomies, appendectomies, leg amputations, herniotomies, vaginal and rectal work, one thoracotomy, and two breast operations.

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INDICATIONS FOR SPINAL ANESTHESIA

There is no contraindication of any kind to spinal anesthesia except a moribund condition of the patient. Patients with hypertension and hypertensive heart disease furnish the largest number of bad reactions. The drop that spinal anesthesia causes in the blood pressure is directly related to its height before operation. The higher the blood pressure, the greater the drop. Such patients stand sudden lowering of blood pressure poorly, even in everyday life. As is the case with general anesthetics, obese patients do not do so well as thin ones. Extreme age presents no contraindication to spinal anesthesia. In this series the ages ranged between ten years and ninety-two.

PRELIMINARY MEDICATION

The practice of inducing preliminary narcosis by the administration of both morphin and scopolamine, or by the use of sodium amytal or avertin, is altogether unnecessary and in many cases rather dangerous. Since on rare occasions spinal anesthesia causes severe reactions, it is best that there be no other drug complicating the condition. Besides, patients are not sufficiently unconscious to remain quiet during the operation and not conscious enough to coöperate. Experience has shown that, no matter how nervous a patient may be, when spinal anesthesia is successfully induced, he will calm down and remain perfectly relaxed all through the operation.

A single injection of morphin gr. 1/6 to 1/4 half an hour before operation is, to my mind, all that is necessary. It helps to allay the fear which patients experience before entering an operating room, and elicits their coöperation for the spinal puncture.

The employment of ephedrine before the induction of anesthesia is of great value, especially to patients with low blood pressure. This drug raises the blood pressure and tends to keep it up for a certain length of time.

It is not advisable to give liquids or food before an operation under spinal anesthesia, since with the stomach empty patients are less likely to be disturbed by nausea and vomiting.

DRUGS AND DOSAGE

Although various drugs have been tried at different times, novocain is the drug mainly used at present. In the present series three different preparations of this drug have been employed:

the C. tablet (novocain 0.05; suprarenin 0.000083 grams), the crystals, and spinocain. There is little difference between the C. tablet and the crystals except that the latter is more easily soluble in the spinal fluid. Spinocain, on the other hand, as a solution is much more convenient to use but decidedly more dangerous than the other two. Precise control of the level of anesthesia under spinocain is not always obtainable. The tiltometer recommended by Pitkin, which gives the exact angle at which the table should be set, is helpful but does not always insure success. The specific gravity of the spinal fluid varies from 1.001 to 1.009. So that, when a solution like spinocain, which has a specific gravity of about 1.000, is injected into the subarachnoid space, the least change in the patient's position may send the spinocain in either direction with great rapidity. Spinocain also, on account of its being prepared with a starchy paste, does not readily mix with the spinal fluid. This renders the solution more dangerous, since it may reach the brain in full strength and cause paralysis of the vital centres.

Opinions differ as to the amount of novocain to be used for various operations. Different observers recommend 100 to 400 milligrams. Some employ the same amount no matter what the operation or the condition of the patient. Others vary the dose according to operation but do not take the patient's condition into account. Both factors should be taken into consideration.

In determining the exact dose of novocain to be injected, one must take into account, besides the condition of the patient and the kind of operation, the speed of the surgeon who is to perform it. Certain operations require larger doses than others, but one must first ascertain if the patient's condition warrants giving him a large dose. As a rule very sick patients or those in shock possess a special susceptibility to novocain and require much smaller doses than normally healthy ones. Similarly, if one surgeon takes only one half hour to do a hysterectomy and another consumes thrice as much time for the same operation, it would be inadvisable to administer the same dose in both cases. Each case, therefore, should be judged according to its merits, and only from large experience can one gain a working knowledge of the right amount of novocain to be used in a given case.

In the last 968 cases of this series the crystals have been employed. After experimenting with various doses for a long time, I came to the conclusion that the maximum dose should not exceed 200 milligrams of novocain. Although larger doses are tolerated by many patients, such doses are, however, too frequently hazardous; 200 milligrams, then, is the maximum dose, 150 the average, and 100 the minimum dose.

TECHNIC

The 20 gauge lumbar needle with a short bevel of about 45 degrees is the most satisfactory for spinal anesthesia. The syringe, preferably a Luer-Lok, should be of 3 to 5 c.c. The injection is done either in the sitting or side position, whichever is more convenient. The sitting position is usually preferable, especially in patients who are obese or who have deformed spines. With spinocain, however, it is extremely dangerous to inject in the sitting position and many deaths have resulted from this practice. The solution should not be injected until one is sure that the point of the needle is within the subarachnoid space. This can be ascertained by the ease with which spinal fluid can be drawn up into the syringe. If this is not possible, then the point of the needle is either outside the dura or else a nerve of the cauda equina is blocking its lumen. The needle should then be pushed a little inward or outward until free communication is established.

The site of the lumbar puncture varies according to the site of operation. In all operations upon the bladder, perineum, rectum, and lower extremities the solution has been injected in the fourth lumbar interspace. In the abdominal operations below the umbilicus, the third lumbar interspace was employed. In upper abdominal operations the solution has been injected into the second lumbar space. It has not been necessary to utilize any other interspaces.

The length of time the anesthesia will last depends upon the dose and degree of concentration of the drug. Any operation upon the upper abdomen or kidney requires an injection of 200 milligrams of novocain in the second lumbar interspace. Any abdominal operation below the umbilicus, lasting less than an hour, requires an injection of 150 milligrams into the third lumbar interspace. Should the operation consume more than one hour, 175 to 200 milligrams may be necessary. In operations upon the perineum and rectum 100 milligrams is sufficient. For amputations below or above the knee 150 milligrams is ample. Patients who are about to undergo Caesarian operations do not tolerate large doses of novocain well. It seems that the effect of the spinal anesthesia, combined with the shock of sudden emptying of the uterus with its attendant loss of blood, predispose these patients to untoward reactions and a higher percentage of fatalities. These patients should, therefore, not be given any more than 150 milligrams, even in cases where sterilization is part of the operation. In two-stage operations, such as repair of cervix and perineum with a laparotomy for suspension of uterus or hysterectomy, 200 milligrams of novocain injected in the fourth lumbar space in concentrated solution has invariably produced anesthesia sufficient for both stages. The crystals are dissolved in 2 c.c. of the patient's spinal fluid.

The weight of the patient should also have some bearing upon the dose to be used, somewhat larger doses being indicated in heavy patients.

Children should be given 15 to 20 milligrams of novocain more than their proportionate weight would indicate. Similarly the patient's height should be taken into consideration when choosing the interspace for the puncture, since the level of the second lumbar space in a tall patient may correspond to the level of the third in a short one.

The level of anesthesia depends upon the following factors: the dose of the drug, the place of injection, the pressure with which the solution is injected, the amount of dilution with the spinal fluid, and the degree of Trendelenburg position. The experienced anesthetist will utilize any number of these factors in order to get the anesthesia up to a desired level.

UNTOWARD REACTIONS

The most dangerous reactions and fatalities have occurred within the first five to ten minutes after the injection of the solution. Respiratory paralysis is usually the cause of early death, since invariably patients who died soon after induction of the anesthesia have complained of difficulty in respiration. The later reactions are mainly caused by depression of the circulation, which, in turn, is due to vasomotor dilatation. These reactions are always preceded by a marked drop in blood pressure, weak pulse, pallor, perspiration and weakness. A complaint of difficulty in respiration should be of immediate concern to the anesthetist. Severe reactions are ushered in by persistent vomiting, profuse perspiration, extreme pallor, marked restlessness, weak and thready pulse, and zero blood pressure.

CARE OF THE PATIENT DURING THE OPERATION

No two patients react similarly to the effects of spinal anesthesia. A small percentage of patients show a special idiosyncrasy to the presence of novocain within the subarachnoid space —or for that matter within the circulation also —with the result that severe reactions occur. On the other hand, there are patients who show a peculiar tolerance to novocain and get an anesthesia which is either incomplete or which wears off in a very short time. With this in mind the anesthetist must be ready to treat conditions not only when they arise, but also to anticipate possible untoward effects according to symptoms and signs before and during the operation.

In all cases where high anesthesia is desired and where the maximum dose of the drug has been employed, the patient should be put in Trendelenburg position of about 25 degrees. If the patient bears up well, no change is made, but, should he show the least reaction or should there be a marked drop in blood pressure, then the extreme Trendelenburg position should be resorted to.

The operation should not start before the anesthesia is well established. This requires from three to ten minutes. Anesthesia which takes longer than fifteen minutes to manifest itself will probably be incomplete or a failure. If the patient becomes restless or shows a tendency to complain on the least sensation of pulling upon the abdominal organs, a hypodermic of morphin gr. 1/6 to 1/4 should be given immediately.

Nausea and vomiting are sometimes troublesome, especially in high anesthesias. They may be due to the effect of the drug alone, or to many other causes. Very often pulling on the gall bladder and the emptying of its contents into the stomach will cause nausea and vomiting. Similarly traction on the uterus or the shelling out of a prostate will give like manifestations. When the operation permits, a patient should be encouraged to vomit up whatever may have accumulated in his stomach; there is no use trying to keep from vomiting a patient whose stomach is full of contents; he will remain nauseated and restless all through the operation. Most patients show marked pallor before vomiting and, as soon as they get rid of the offensive stomach contents, regain their normal color. On the other hand, if the patient keeps on gagging without bringing anything up, it is advisable to administer oxygen inhalation at short intervals. This, in many instances, especially in the nervous type of patient, stops the gagging.

The anesthetist should always be on the lookout for bad reactions with marked drops in blood pressure in patients with hypertensive heart disease. In these cases extreme pallor, profuse perspiration, cyanosis, weak and thready pulse, and zero blood pressure are not at all uncommon. It is remarkable, however, how rapidly they recover from this condition, provided treatment is instituted immediately. Caffein sodium benzoate, having a direct effect upon the heart, is of much more value in these cases than ephedrine or adrenalin. The last two drugs are supposed to act upon the vasoconstrictors which are contained in the anterior motor roots; the latter being paralyzed, no amount of stimulation will produce any effect.

The pulse and respiration usually slow down under spinal anesthesia. This is due to the fact that the depressive effects of the vagus are afforded free action upon the thorax, the sympathetics, which have the stimulating effects, being entirely cut off through paralysis of the rami communicantes. Similarly the vagus, being the accelerator of the gastro-intestinal tract, increases peristalsis during the time that the sympathetics are not in a position to counteract this effect by their opposite influence in this region.

It is advisable to stop all operative procedures in case of a marked reaction. Where the reaction occurs before the operation has started, it is best to wait until the patient's condition improves. In case a severe reaction sets in after the operation is over, the patient should remain on the operating table in Trendelenburg position. Body heat should be conserved and stim-

ulants, which should include caffein and adrenalin hypodermically and brandy by mouth, should be administered without delay. A complaint of difficulty in respiration demands immediate treatment with carbon dioxide and oxygen. Should the respiration cease altogether, artificial respiration should be resorted to and kept up until normal respiration is established. In one case of this series an old man of 84 stopped breathing and artificial respiration had to be kept up for nearly half an hour before normal respiration was established.

Relaxation under spinal anesthesia is perfect and the muscles can be readily retracted. The surgeon, however, should not take unscrupulous advantage of this circumstance, since it must not be forgotten that the shock following operation will depend on the severity of the manipulations and the convalescence will be smoothest where speed and gentleness predominate. As the sensation of traction is not abolished, gentleness in handling will tend to prevent nausea and vomiting in addition to shock after the anesthesia has worn off.

Should anesthesia be lacking or incomplete, or the relaxation be so poor that operative procedures are impossible, a general anesthetic may be administered to supplement the spinal anesthesia. If the solution was not injected outside the dura, the amount of inhalation anesthesia required will be very small. Also a supplementary anesthesia can be given in cases where the spinal anesthesia wears off before the operation is finished. Sometimes an additional hypodermic of morphin will tide a patient over for fifteen or twenty minutes and permit the completion of the operation. In this series the cases requiring supplementary anesthesia were not more than eight per cent. The addition of a little gas-oxygen at the end of the operation is, to my mind, a far safer procedure than the administration of large doses of novocain for the purpose of obtaining a prolonged anesthesia.

In lower abdominal operations the anesthesia lasts longer than in upper abdominal; and in operations which do not involve the abdomen at all the anesthesia lasts still longer. The return of motor function precedes the return of sensation, and difficulties in long abdominal operations are encountered when closure of the abdomen is attempted. The abdominal muscles become rigid even though the patient experiences no pain, and additional anesthesia is required in order to obtain relaxation.

SPINAL ANESTHESIA IN HEAD AND CHEST SURGERY

That spinal anesthesia can be used in head and chest surgery has been proved by Koster of New York and by four cases of this series (two breast tumors, one thoracotomy, and one abscess of the liver involving the lower lobe of the right lung). However, it is not justifiable to subject a patient to the danger of a high anesthesia when other safer means are available. Undoubtedly bad reactions and fatalities are always associated with too high anesthesias, while vomiting and restlessness—a concomitant of high anesthesia—will be a more troublesome factor in operations about the head and neck. Avertin or sodium amytal give very satisfactory results in head and chest surgery, where the relaxation is not of primary importance. These two drugs may be used occasionally for complete, but more often for basal, anesthesia combined with local anesthesia, gas-oxygen or ether.

Another factor that militates against the use of spinal anesthesia for operations above the diaphragm is the fact that anesthesia sets in first in the toes and then works upward, while the reverse is true when the anesthesia begins to wear off. The time left between the late onset and the early disappearance of the anesthesia is, in the majority of cases, very short.

ADVANTAGES OF SPINAL ANESTHESIA

Patients who have had experience with different anesthetics usually prefer spinal to inhalation anesthesia. The postoperative period is more comfortable, vomiting being absent or diminished and gas pains being reduced to a minimum. The ability to take liquids almost immediately after the operation, the absence of kidney irritation, and the avoidance of the depression which may follow a general anesthetic are all factors contributing toward the patient's welfare.

Regarding cardiac and respiratory complications, there are so many other contributing factors beside the anesthesia that nothing definite can be gained by simply quoting statistics. Such complications as postoperative coronary thrombosis, pulmonary embolism, and pulmonary atelectasis may occur under any type of anesthesia, general, local, or spinal. On the other hand, the complications due to irritation of the respiratory tract or to inhalation of foreign substances will be practically nil. In cases of intestinal obstruction, where under a general anesthetic patients often die from drowning in their vomitus, spinal anesthesia is certainly a life-saving method.

The advantages of spinal anesthesia to the surgeon and anesthetist are self-evident. There is the comparatively short time consumed for the induction of the anesthesia, the almost immediate onset, the slow, quiet respiration, and the complete relaxation with the intestine contracted and falling back into the abdominal cavity. There is the coöperation of a conscious patient during and immediately after the operation, the lessened amount of bleeding and the absence of ether odor in the operating room. All these are inestimable aids contributing to the success of the operation.

FATALITIES

It is my belief that every fatality from spinal anesthesia could be avoided, and may be attributed to a mistake on the part of the anesthetist. Every fatality that came to my attention, whether from this series or from reports of other men, could be traced to some definite error. Either the dose was too large, the drug not of the proper kind, the technic faulty, or the patient not fit for spinal anesthesia. On the other hand, some deaths occurring on the table or soon after the patient is put to bed may be due to hemorrhage, surgical shock, large thymus, or many other causes, and yet the blame for the fatality may be laid to the spinal anesthesia. In this series of 1875 cases there were two deaths which were caused directly by the spinal anesthesia.

CASE REPORTS

A. G., male, 62 years old. Operation, second stage suprapubic prostatectomy. Preoperative condition: diabetes, chronic bronchitis, myocarditis, general debility. The patient recently recovered from pneumonia, which followed a cystotomy under local anesthesia, six weeks previously. Blood pressure 90/45, pulse 84. The patient was pale and emaciated. Preliminary medication: morphin gr. 1/6, ephedrine gr. 3/4. Novocain Tab. C. (150 mg.) was used for the spinal anesthesia. About half a minute after the novocain solution was injected, the patient stopped breathing and became pulseless. Adrenalin, caffein, oxygen, and artificial respiration were of no avail.

M. B., male, 57 years old. Operation, cholecystectomy. Preoperative condition: asthma, chronic bronchitis. Blood pressure 160/100. Preliminary medication: morphin gr. 1/6, ephedrine gr. 3/4. Spinocain 2 and 1/2 c.c. used (250 mg.). The solution was injected into the second lumbar space in side position. The patient was turned on his back and the nurse started to place him in the gall bladder position. The patient, trying to be helpful to the nurse, lifted his head and shoulders. (I had turned away for a moment to get the chart.) Before the operation had started, he suddenly began to complain of difficulty in breathing. He soon lapsed into unconsciousness and became pulseless. All stimulants and artificial respiration failed.

In consideration of the two fatalities in retrospect, it would seem that both deaths could have been avoided. In the first case the patient was too ill to withstand operative procedure, even the manipulation of spinal anesthesia. In the second case the dose was rather large, and the use of spinocain, followed by the patient lifting his head and shoulders, was probably responsible for the fatal outcome.

There were two other cases in which the patient died after the operation was over.

M. L., female, age 28. Operation, thoracotomy. Preoperative condition: lung abscess, aortic regurgitation, anemia and emaciation. Weight 85 pounds. Blood pressure 100/80. Spinocain 1 and 1/2 c.c. (150 mg.) used. Injection in second lumbar space. Preliminary medication: morphin gr. 1/6, ephedrine gr. 3/4. Patient did well throughout the operation, which lasted 40 minutes. Her blood pressure rose to 110/70, and her pulse remained at 120. At the operation her right lung was found entirely gangrenous, full of pus and sloughs. About 45 minutes from the time the solution was injected, while being wheeled to her room, she began to complain of a choking sensation. On being put to bed, she became unconscious and pulseless, but respiration continued for about five minutes longer.

C. I., female, 35 years old. Operation, Caesarian. Preoperative condition: marked obesity (wt. 250 pounds), nephritis. Blood pressure 160/80. Preliminary medication, ephedrine gr. 3/4. Novocain crystals 200 mg. used. Considerable difficulty was encountered in entering spinal canal on account of obesity. Puncture in third lumbar space gave pure blood. The needle was removed and in attempting to insert it in the second lumbar space, it broke. The broken end was easily removed. The needle was inserted then in the second lumbar space, where clear fluid was obtained. The patient's condition was good throughout. The blood pressure dropped to 140/70, the pulse was 100, her color was good and she conversed intermittently. At the termination of the operation, one hour following the spinal injection, and as the anesthesia was beginning to wear off, she suddenly complained of severe headache. Cyanosis developed and she died on the table.

While it is impossible to estimate definitely how great a part the spinal anesthesia played in causing the death of the last two patients, it would appear that the anesthesia was not solely to blame. The arguments for the cause of death being other than spinal anesthesia are: first, the length of time consumed from the induction of anesthesia to the occurrence of death. Secondly, each patient did well throughout the operation. Thirdly, in both cases the anesthesia had begun to wear off at the time of death. Such sudden fatalities have occurred in many instances under general anesthetics also. There are in the literature reports of numerous instances of unexplained deaths occurring under various anesthetics, either general, local or spinal, which are similar to the fatalities reported in this group of spinal anesthesias.

SUMMARY

Spinocain does not give a controllable spinal anesthesia. On the contrary, with Pitkin's solution the anesthesia is more out of control than with any of the other preparations.

The dose should be regulated according to the demands of the operation. It should not exceed 200 milligrams of novocain.

Depending upon the site of the operation, one can use the second, third or fourth lumbar interspace. It is not necessary, and rather dangerous, to go any higher.

There are five factors upon which the level of anesthesia depends: the dose of the drug, the interspace into which it is injected, the pressure with which it is injected, the amount of dilution with spinal fluid, and the degree of Trendelenburg position.

Caffein and adrenalin are the most efficient stimulants where bad reactions are encountered. Difficulty in respiration is an alarming symp-

tom, especially when accompanied by cyanosis. It should be treated with carbon dioxide and oxygen, and artificial respiration.

Head and chest surgery can be done under spinal anesthesia. The danger of high anesthesia is excessive, however, and its duration is limited.

Not all fatalities during or immediately after operation are due to spinal anesthesia; they occur under general and local anesthesias also.

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BLASTOMYCOSIS

Report of a Case

BY JOHN GODWIN DOWNING, M.D.*

BLASTOMYCOSIS is so rare in New England that a case occurring here is worth reporting. Outside of California and Illinois this disease is seldom seen. In May 1894 Gilchrist, at a meeting of the American Dermatological Society, first demonstrated sections, and in November 1894 Busse reported a fatal case in which the purulent discharge showed the large double contoured organism about ten microns in size.

Blastomycosis is a chronic infection produced by the blastomyces, a pathogenic yeast which causes a disorder in the skin characterized by the formation of reddish, elevated, moist, verrucous, suppurating lesions with definite borders. These lesions present numerous deep-seated abscesses with very small openings, from which a purulent discharge may be expressed. The lesions may occur in the internal organs with a resulting pyemia and a fatal issue. Blastomyces grow readily at room and incubator temperatures; on Sabouraud's medium it shows an abundant white growth. It has been found in decaying wood.

The disease generally begins on the exposed surfaces. In a study of thirty-eight cases cited in the transactions of the various sectional Dermatological Societies and reported in the *Archives of Dermatology and Syphilology*, in the past ten years, every proved case was an adult male engaged in some type of manual labor, and the location most commonly affected was the face. In twenty-one cases, among which were eight of generalized blastomycosis, the lesion first appeared on that part of the body. The other locations, in the order of their frequency, were the hands, four cases; the feet, three; the scalp, one; the neck, one; the buttocks, one; other cases involving a combination of these areas. Cutaneous blastomycosis responds very slowly to treatment, but as a rule can be cured, although the majority of patients in whom the disease is systemic die. Early diagnosis and treatment may prevent fatality.

The treatment of this disease has not been established, although all agree that the internal use of iodides is of great value; in a large majority of the reported cases they were used. The diversity of treatment in the above-mentioned cases is interesting. X-ray was used in the majority; in others sodium iodide, intravenously, appeared to be of value. Ultraviolet ray, freezing the area by means of carbon dioxide snow, and curettage were also employed. Sulpharsphenamine was given intravenously with slight success; compound iodine solution, intravenously, was used but discontinued because of the great pain it caused; a vaccine of cryptococci was employed with varying success; a wet dressing of silver chloride and, lastly, electrocoagulation. In no case was surgery, other than curettage, applied.

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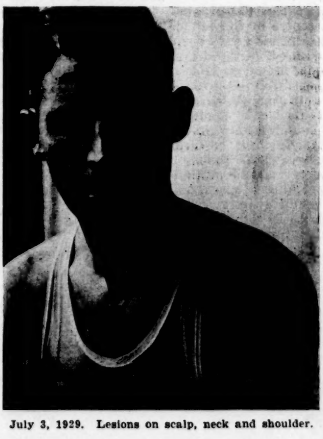
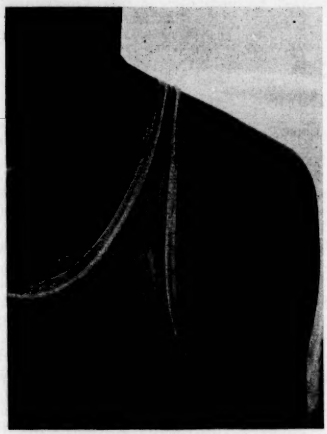
CASE REPORT

CASE No. 20050. A man, aged 34, entered the Dermatological Out Patient Department of the Boston City Hospital July 3, 1929, complaining of sores of three months' duration on his scalp, neck and left shoulder, which began as small pimples and gradually increased in size to their present proportions.



July 3, 1929. Lesions on scalp, neck and shoulder.

These lesions did not bother him except for an occasional stinging sensation. He states that he had worked at various kinds of labor, all over the United States, including work in circuses and around wood-yards. On inquiry about any medicinal back-



July 3, 1929. Lesions on neck and shoulder.

ground he stated that previously he had taken occasionally bromoseltzer, but had taken none for the past six months.

Physical examination showed on the scalp two ovoid, fungating lesions, about 2½ cm. in diameter, at the midfrontal area of the scalp, just inside the hairy margin. In the middle anterior surface of the neck a flatter area, 3 cm. by 4 cm., and over the centre of the left deltoid muscle a growth about the same size were found. These lesions were sharply defined, with abruptly sloping borders, reddish-purple in color, and showed a papillomatous, verrucous swelling covered by dark crusts. There was no apparent discharge, but on pressure a thin purulent discharge exuded between the papillae, which, on examination, showed rounded refractile bodies, and, later, on culture, an abundant white yeast-like growth. Biopsy was done and the section showed marked proliferation of the epithelium with large miliary abscesses in the various layers of the skin and a marked infiltration of small round cells and giant cells with an abundance of double contoured organisms. The patient and tissue sections were shown at the meeting of the New England Dermatological Society.

The lesions on the neck and shoulder were excised under local anesthesia and the skin edges drawn together and held by skin clips. The wounds healed by first intention and never showed any recurrence. On account of the location, the scalp lesions were frozen with CO_2. The patient complained considerably of the resulting pain, and the lesions were not improved; in fact, they seemed larger. Later electrocoagulation was tried, this method causing a marked decrease in their size, but the patient refused further treatment on account of the subsequent pain. Potassium iodide was prescribed internally and a local application of tincture of iodine 10, alcohol 50 was applied frequently with good result. The patient then disappeared, but returned in January 1931, when he stated that he had used the iodine therapy periodically since his last visit. The lesions on the scalp were healed, but in the middle of the forehead, just below the hair

January, 1931. Lesion on midforehead, an extension of the previous lesions, which were healed at this time.

margin, there was a flat, round area the size of a cent still showing activity. The lesions on the neck and shoulder showed no recurrence. The patient refused further treatment and has not been seen since.

CONCLUSION

1. A case of blastomycosis is reported on account of its rarity in this locality and its marked resistance to treatment.

2. Where it is possible to excise the lesion, surgery promises a rapid and effectual method of combating the disease.

CYSTIC DEGENERATION OF THE SEMILUNAR CARTILAGE*

BY EDWIN PYLE, M.D.†

I AM prompted to report another case of this unusual condition in order to keep it fresh in our minds, hoping that more cases will be diagnosed and the patients relieved of their symptoms.

Mrs. J., age 34 years, complained of pain over the lateral aspect of the right knee for the past 5 years. The pain was persistent sticking in character and oftentimes very severe. In the beginning it was of sudden definite onset and increased in severity as time went on. The pain was confined to the lateral aspect of the knee but at times of severity it would radiate up and down the outer side of the leg. There was no history of injury, coincident or preceding the onset of pain but slight swelling over the site of pain

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was noticed in the beginning. The pain was worse immediately after lying or sitting down and was relieved by heat. A constant dull ache, which at times became sharp and acute, was always present, especially if the knee was twisted or if the lower leg was abducted. The patient felt more comfortable when standing or walking and would often seek relief at night by taking large doses of aspirin and by walking the floor. There was a sense of great instability in the knee especially when going up or down stairs so that on an average of 4 to 5 times a week the knee would suddenly give way and allow the patient to fall. Strange to say at these times there was no pain, no increase in the swelling and no subsequent accumulation of fluid in the joint. This instability was a very marked and troublesome symptom.

Physical examination showed a knee-joint normal except for indefinite swelling over the lateral aspect.

The swelling was especially marked beneath the short lateral ligament where it was definitely fluctuant. This area was neither painful nor tender, the pain and tenderness being confined to the anterior region of the cartilage where the swelling was less distinct and less marked. There was a full range of painless motion in the joint but discomfort was experienced if the knee was extended while pressure was applied with the thumb over the anterior part of the semilunar cartilage. The x-rays were negative except for the indefinite soft tissue shadow of the fluctuant mass.

An incision was made parallel to and one-half inch lateral to the patella through which the knee-joint and the cartilage were exposed. The outer portion of the semilunar cartilage was made up of numerous thin-walled cysts varying in size from 1/16 to ⅛ inch in diameter; there were about 20 such cysts, the largest being the one felt beneath the lateral ligament. The inner border of the cartilage appeared normal and the entire cartilage seemed to be neither too firmly nor too loosely attached to the edge of the tibia or the joint capsule. The cystic contents were rather thick clear mucoid material not unlike the contents of ganglia. The lining of the cysts appeared white as compared with the surrounding yellowish tissue. The cystic process was confined to the anterior half of the cartilage. This area including the largest cyst beneath the lateral ligament was easily excised and the wound closed in layers. Except for a slight skin infection the convalescence was rapid, the patient showing a painless normal range of motion within three weeks of operation. There has been no pain nor weakness in the knee since the removal of the cartilage.

The pathological report of Dr. Collins from the Waterbury Hospital is interesting in proving that the condition is a degenerative one and that the cysts are lined with flattened cartilage cells rather than endothelial cells.

Dr. Collins' report reads as follows: Sections show a combination of degenerative and reparative processes which have largely destroyed the cartilage. The destructive process is more marked in the inner portions where wide areas of granular and fibrillar débris are found. This material stains intensely blue with hematoxylin and eosin. No recognizable cells are noted within these areas. They are occupied by clear cystic spaces the only lining of which is the débris in which they are situated.

As the periphery is approached the cysts grow progressively larger. The cartilage here has been replaced by a deep staining cellular fibrous tissue which forms several concentric layers surrounding the larger cysts. They have in some instances a narrow lining of cells which stain slightly deeper than the surrounding fibrous tissues, from which the living cells seem to be derived.

In this peripheral portion there has been considerable fibrous tissue proliferation and blood vessels are over-abundant. The vessels are extremely thick-walled and their endothelium is quite cellular and hyperplastic. Scattered round cells and plasma cells are noted, and in certain small areas they are fairly numerous, suggesting a low-grade inflammatory process. The etiology of the process is not apparent. The sequence seems to be (1) degeneration of cartilage, (2) replacement of degenerated areas by fluid, and finally (3) organization by fibroblastic tissue.

PREVENTION OF STILLBIRTHS

The data presented through figures from the United States collected by the U. S. P. S. are grounds for a plea for continued and greater efforts directed toward the prevention of stillbirths. Out of a number of causes of fetal death only three* of greatest importance have been considered in a brief paper. The most important of all is dystocia, or the complications of labor. In the prevention of stillbirths from this cause we must have better obstetrics and midwifery, more careful medical examinations during the last month of pregnancy, and more research into the fundamental causes underlying fetal death. Before the patient comes to the delivery room, the obstetrician should always be familiar with the position and presentation of the fetus, the pelvic measurements, and any other ascertainable facts which might have any influence on labor. The devotee of instrumental delivery should be as expert as a brain surgeon, and even then should not be too eager to apply his knowledge. He should learn how not to interfere with normal birth.—*Excerpt from reprint 1445, Public Health Reports.*

*Complications of labor, toxemia of pregnancy, syphilis.

STUDIES IN THE THERAPEUTICS OF MALARIA

At the Wellcome Chemical Research Laboratories, London, birds are being used in research work in connection with efforts to find the most efficient treatment of malaria.

Birds are known to be susceptible to malaria and can be procured in abundant quantities.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 17241*

EPIGASTRIC PAIN AND INDIGESTION FOR FOUR WEEKS

MEDICAL AND SURGICAL DEPARTMENTS

PRESENTATION OF CASE

DR. EARLE M. CHAPMAN**: This case is that of a fifty-two year old American laborer who came into the Emergency Ward on the night of March 10. He was at that time very dull and unable to give a good history. His chief complaints were a vague dull pain through his epigastrium and stomach trouble for the previous four weeks.

His past history showed that he had been here in 1909 with acute rheumatic fever and in 1911 for appendectomy. He had an uneventful convalescence and was discharged feeling quite well. In the interval of twenty years he had been quite well, working regularly, and had had no attacks of abdominal pain and no discomfort of any kind until four weeks before admission, when there was a gradual onset of what he called "stomach trouble". This consisted of dull pain in the epigastrium and over the umbilicus radiating towards the sternum, not to the shoulders or down the arms. It was relieved by food, milk and soda. About three weeks before admission his urine became quite dark and his skin became jaundiced. This had grown progressively worse until entrance. At that time he was quite jaundiced and had anorexia and occasional nausea and vomiting. He had lost twelve pounds in weight.

He was first seen in the Emergency Ward by the East Medical service.

He was found to be fairly well developed and nourished and jaundiced. He had signs of recent weight loss. His teeth were carious. The glands were normal. The heart and lungs were negative. The abdomen was quite distended with gas and was difficult to palpate. No fluid wave was obtained, but on percussion it seemed that the liver dullness was quite diminished and there was dullness in the flanks. Sounds of peristalsis were heard. They could percuss the liver dullness only on a small band between the sixth and eighth ribs on the right. Rectal examination showed some internal hemorrhoidal tabs.

When he arrived in the ward the following morning he was quite comfortable lying in bed, although he was dull and lethargic. He had only a little abdominal pain. He felt better than he had. He showed no change untii four o'clock in the afternoon, when the student taking the history noticed that it was becoming more and more difficult for the patient to focus his attention on the history and that he complained of increasing abdominal pain. This progressed rapidly, and he was really in distress after an hour and had signs then of a rather typical surgical abdominal condition with diffuse tenderness on release of pressure. The liver dullness was not obliterated. About five o'clock, when I saw him, the surgical service was called immediately.

He was in the ward such a short time that the laboratory findings are rather scanty. The urine showed much bile. The red blood count was 4,400,000, the hemoglobin 70 per cent, the white blood count 3,900. The smear was interesting in that it showed 4 per cent of very young polynuclears, 4 per cent myelocytes and 1 per cent myeloblasts. The icteric index was 50 to 75. A liver function test showed 100 per cent retention of dye in thirty minutes. A van den Bergh test showed 16 milligrams of bilirubin.

The temperature was normal at entrance. At the time when he developed this acute surgical condition his temperature was 99.2° by rectum and his white cell count was 3,000.

Immediate exploration was decided upon and done. He went steadily downhill after the operation, and died within twenty-four hours. When he was examined just before death he was thought to have bilateral pneumonia.

CLINICAL DISCUSSION

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

What is the significance of a decrease of the liver dullness? Do you infer decrease in the size of the liver?

STUDENTS: It might be due to a high diaphragm. Might it be due to gas in the abdomen?

DR. CABOT: Ordinarily when there is gas in the colon pushing up between the liver and the abdominal wall we get decrease or even absence of liver dullness. That happens a hundred times for every once that decrease in the liver dullness is due to decrease in the size of the liver. Decrease in the size of the liver is tremendously important and ordinarily points to acute toxic hepatitis. We must establish it if we can. But we never should assume it unless we are sure it is not due to gas in the colon. We see somebody almost every day with absence of liver dullness due to gas in the colon. Of course it could also be due to free gas in the peritoneal

*The following report gives the essentials of two discussions, one in Dr. Cabot's Third Year class, one at a conference of the hospital staff.

**Recently senior interne on the West Medical service.

cavity. I do not suppose we are going to find free gas.

The value of a blood examination all depends on who did the count. That is a very queer blood count. We cannot tell in the least whether to take it at its face value or not.

No one can ask for anything more than 100 per cent. dye retention. Unless there is some gross error that means very serious organic liver disease, a terminal stage of cirrhosis or toxic hepatitis.

They were certainly thinking of acute perforative peritonitis with gas. They especially noted that the liver dullness was not obliterated.

We ought to try to make out for what the surgeon performed the operation. Up to the evening after admission all the rest of the history suggests advanced liver disease, either an advanced stage of ordinary cirrhosis or the last stage of acute toxic hepatitis. But I have never seen so much pain and tenderness with acute abdominal symptoms in that disease. Liver disease is however one that goes with hemorrhages, and I can conceive of an intraperitoneal hemorrhage producing such symptoms. I think they operated for perforative peritonitis. I wonder what was thought to have perforated. It might be the gall bladder. But of course if gall bladder disease was the whole thing we have no right to have such extraordinary retention of the liver dye.

A STUDENT: How about peptic ulcer?

DR. CABOT: That is possible, except that I always hesitate to make two separate diagnoses unless something in the history compels it. Certainly peptic ulcer with perforation would not account for the 100 per cent. retention of the liver dye or for the jaundice.

I think they operated for perforative peritonitis, cause possibly unknown, possibly peptic ulcer. They ought to have had in mind that there was probably extensive liver disease besides; I should say acute yellow atrophy is the most probable.

DR. CHAPMAN: At operation it was found that he had a perforated duodenal ulcer, general peritonitis and a small cirrhotic liver. The abdomen was closed and he went to the ward directly.

DR. JOE VINCENT MEIGS: Nothing was found in the liver except cirrhosis?

DR. JOHN I. BRADLEY: Nothing at the time of operation.

DIFFERENTIAL DIAGNOSIS

DR. CABOT: I think the most interesting question is what will be found in the liver. I do not see that we have much to suggest cirrhosis. When we are trying to make a differential diagnosis between cirrhosis and acute toxic hepatitis we go first to the history, looking for evidence of alcoholism there, then for evidence of portal stasis, which we can have in either of the two diseases, though it is commoner in chronic cirrhosis. I do not see that there is any evidence of that. Jaundice may be present in either, but it is commoner with the toxic variety. On the whole this seems to be more like the toxic variety, or acute yellow atrophy, than it does like cirrhosis.

A STUDENT: That blood count cannot be explained by syphilis?

DR. CABOT: No.

A STUDENT: How about cancer of the prostate with tenderness and enlargement and metastases?

DR. CABOT: We have not the physical signs on which one can say cancer of the prostate. With cancer the prostate is particularly hard, often described as "stony hard", fixed, ordinarily not tender. This is not described in that way. Even with cancer of the prostate we should have no reason to expect a blood like this. It is a very queer report. I do not think there is anything the matter with the blood at all.

A STUDENT: Is the white blood cell count of 3,000 best explained on the basis of acute yellow atrophy?

DR. CABOT: I do not see that it throws light here one way or the other. It is not characteristic of cirrhosis or of acute yellow atrophy or of peritonitis. We often see leukopenia if there is an overwhelming infection in the body, as in peritonitis or diphtheria. The overwhelming infection keeps the leukocytes down. But that does not help us to understand what is the matter with the liver.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Perforated duodenal ulcer.
General peritonitis.
Bilateral bronchopneumonia.

DR. RICHARD C. CABOT'S DIAGNOSES

Acute yellow atrophy of the liver.
Perforative peritonitis, possibly due to peptic ulcer.

ANATOMIC DIAGNOSES

Acute yellow atrophy of the liver.
Ulcers of the duodenum with perforation of one of them.

PATHOLOGIC DISCUSSION

DR. BRADLEY: There was an early acute general peritonitis, the serosal surfaces being injected and covered by fibrin. The duodenum showed two ulcers, both in the first portion a short distance beyond the pylorus. The first ulcer, the one that had perforated, was about one centimeter beyond the pylorus. About one centimeter beyond that was the second ulcer. Both had the appearance of acute active ulcers. There were small varicosities in the esophagus just above the cardia.

The liver was the most interesting part of the autopsy. It was extremely small, weighing 850 grams. It was of dark greenish color and the surface was for the most part smooth but with numerous small scattered slightly elevated light greenish-yellow areas. It was flabby, but elastic to the touch, rubbery in consistency. The surface was finely and closely granular. The larger granules or nodules were light yellowish or greenish. On section the bulk of the liver substance was light reddish and lacked the usual structural markings. The surface was sprinkled with numerous small light yellowish or greenish nodules. The gross appearance was that of acute yellow atrophy with beginning regeneration. Microscopic examination confirmed that.

The lungs were markedly edematous and congested but showed no definite consolidation. The coronaries showed marked sclerosis but no diminution of their lumen. The examination was otherwise negative. We have no information to throw light upon the blood picture.

I have a section of the liver showing the extent of the process. The small scattered irregular dark purplish masses represent the islands of remaining liver tissue. The tissue between them is vascular connective tissue, showing a quite marked mononuclear and a moderate polymorphonuclear infiltration. You can see how extensive the destruction of the liver tissue is, all this area now in the field consisting merely of connective tissue with numerous bile ducts scattered through it.

DR. WYMAN RICHARDSON: Had he been taking any drug?

DR. CHAPMAN: We could not obtain any such history. He was so dull and stuporous that no one could get an adequate history of this patient. He quite definitely stated that he had been perfectly well until four weeks before entry.

A PHYSICIAN: Was there any connection at all between the ulcers and the atrophy?

DR. BRADLEY: None so far as we know, from the pathologic viewpoint. Their association, so far as my limited experience goes, is rather unusual. It demonstrates an exception to the rule that one diagnosis will usually cover a case.

DR. CABOT: Another case, then, of two quite separate diagnoses. I do not believe there is any way of connecting the two. Acute yellow atrophy we used to call it, with perforated duodenal ulcer which is said to be acute, not a chronic indurated ulcer. And there is nothing to explain this very imaginative blood.

A STUDENT: There was no cause found for the acute yellow atrophy?

DR. BRADLEY: No. The vagueness of the history here is regrettable. There have been suggestive factors in the other cases we have had recently in the use of medicines. We have nothing to bank on here.

DR. CABOT: It is pretty hard, though, to think of a medicine's giving both duodenal ulcer and acute yellow atrophy. I think we must have two causes.

CASE 17242

CORNEAL ULCERS AND ROUGHENED CONJUNCTIVAE ASSOCIATED WITH FAT INTOLERANCE

CHILDREN'S MEDICAL DEPARTMENT

DR. RALPH W. DAFFINEE*: A white male infant aged six months was admitted to the wards of the Massachusetts Eye and Ear Infirmary on January 10 and transferred to the Massachusetts General Hospital on January 16.

Family history. The father, mother and a sister three years old were in excellent health. One child had died at the age of two years with the diagnosis of thymic enlargement. There was no history of tuberculosis, syphilis or conditions similar to that of the patient.

Past history. The child was born spontaneously at term, weighing 8 pounds 2 ounces. At birth he appeared perfectly normal. He was breast fed for three months, then weaned to a formula of milk, water and dextrimaltose. He had never received cod liver oil, but had been given 9 drops of viosterol daily. Orange juice had been given in one or two ounce quantities somewhat irregularly. There had been only one previous illness, a mild gastro-intestinal upset while he was teething. He had never gained well and had always appeared underweight. He ate well, however, and at one time took 8 ounces of formula at a feeding without any difficulty. His weight had increased to 11 pounds. On admission to the hospital he was being offered whole milk 22 ounces, water 13 ounces, dextri-maltose 1 ounce; 7 ounces, 5 feedings.

Present illness. Six weeks before entry the mother noticed "spots" on the baby's eyes. These were treated by a doctor without much improvement. At the same time the baby seemed suddenly to lose a great deal of weight almost overnight, and his appetite failed. He took only about 4 ounces of formula at a time, and that very slowly. The day before admission he would take only 2 ounces at a time. On the day of admission he refused everything offered. There had been no vomiting or diarrhea.

Physical examination. On admission he was malnourished and markedly dehydrated. There were ulcerated areas on both corneae. His neck was stiff and resisted movement. The arms and legs were moderately spastic. Kernig and Brudzinski were negative. His heart, lungs and abdominal organs seemed normal. His weight was 9 pounds 8 ounces. His head measured 17 inches, his chest 14 inches, his abdomen 12½ inches in circumference.

The temperature was 98° (rectal).

*Resident on the Children's Medical service.

Laboratory data. The hemoglobin was 90 per cent, the red corpuscle count 6,590,000, the white cell count 42,600, 70 per cent polymorphonuclears, 14 per cent lymphocytes, 15 per cent large mononuclears and transitional cells and 1 per cent eosinophiles. Tuberculin tests (1:1000 dilution) were negative. The mother's Wassermann was negative. A smear from the eyes showed Gram-positive cocci in clusters and Gram-positive lanceolate diplococci. The urine was light yellow, clear, specific gravity 1.004, neutral, no albumin or sugar. The specific gravity was persistently low. When he was taking his first formula the stools were large, unformed and light brown. There were small amounts of fat curds and some mucus. The fat content was 15 per cent of the moist weight. When the formula was changed to the skimmed milk and banana flour, the stools were more bulky and still unformed. The color was grayish brown, which is a characteristic finding in stools on feeding banana flour. The curds practically disappeared, and there was no mucus present. The fat content was about 4 per cent of the moist weight.

Eye report. January 20 the right eye showed xerosis of the bulbar conjunctiva, central opacity of the cornea, perforation of the cornea below its center, with the iris in the perforation. The anterior chamber was fairly well formed. The left eye had a central opacity of the cornea and a very shallow chamber.

Course in the hospital. The acute dehydration on admission was successfully combated by hypodermoclysis of 275 cubic centimeters of 2.5 per cent glucose in normal salt solution and later by intravenous injection of 200 cubic centimeters of a similar solution. The baby was put on a formula of whole milk, water and cane sugar, six feedings of 4 ounces daily, with cod liver oil and orange juice. He refused most of this feeding, and for a short period when it was forced there was an elimination of fat equivalent to 40 per cent of the fat intake. He did not however have a diarrhea. The eyes showed but little improvement. Therefore the feeding was changed to skimmed milk, water and dried ripe banana powder as an added carbohydrate. Raw carrot juice was given to supply vitamin A. About 40 calories per pound of body weight was offered and taken eagerly. Later an increase was made to 53 calories per pound and was taken well. On February 7 a proportion of three-quarters skimmed milk and one-quarter whole milk was used with the banana powder in the formula and was well taken. The eyes showed improvement in that the roughness (xerosis) of the conjunctiva disappeared.

On February 11 in the evening he began to cough, refused his feedings and showed some elevation of temperature. Râles were detected in his chest on February 12. The bronchitis seemed to persist. The signs in the chest and the appearance of the child suggested general bronchopneumonia involving especially the right upper lobe. The child grew steadily worse and died on February 15.

Clinical Discussion

Dr. Harold L. Higgins: When we see a child with keratomalacia or xerophthalmia we naturally suspect that the child is suffering from a want of vitamin A. The cases of keratomalacia in the literature always appear in children who are distinctly undernourished. I do not think that we have yet sufficient evidence to say absolutely that keratomalacia appears only in vitamin A deficiency. In studying this child's diet we found that he had been breast fed for three months, then put on a formula of whole milk, water and dextrimaltose. At the present time formulas of that nature are boiled, so it is quite possible that the vitamin A was destroyed. He was never given cod liver oil, but he was given viosterol. Whether that contains vitamin A I do not know, but it cannot contain so much as cod liver oil. Orange juice contains some vitamin A, but not very large amounts.

In studying the clinical course of the disease there are two possibilities that occur to one. This child may have had a sudden failure due to lack of vitamin A, as marked by his eye condition, loss of weight and food intolerance. That is, the absence of vitamin A explains the start of the whole picture. The other possibility is that he had primarily a gastro-intestinal upset and that with the failure to absorb fat he failed to absorb vitamin A, for we know he was absorbing only 40 per cent of his fats; and with failure to absorb vitamin A he got the eye condition.

The child was given cod liver oil on admission. In spite of his getting cod liver oil and a milk-water-sugar formula the eyes did not get better and he was not satisfactorily absorbing fat. Giving vitamin A to the child then did not benefit the eyes.

Only when we discontinued the high fat feeding and put him on banana powder and raw carrot feeding, a feeding he could utilize and digest, did we find improvement in his eyes.

In this case we can make a diagnosis of fat intolerance, which is frequently called chronic intestinal indigestion. Whether a patient gets well or not of chronic indigestion depends on the cause. If it is caused by tuberculosis he probably will not get well. We have good evidence that this child did not have tuberculosis. He did not have syphilis. Neoplasm is a possible cause, but is quite rare at six months. Also, we have no signs of any thrush or fungi such as occur in sprue. We have no history that points towards chronic dysentery. Thus we are not able to trace the cause for this intolerance of fat beyond possible loss of vitamin A.

Under treatment he was getting better. The fat in the diet was being slowly increased and well handled. Then there appeared what appears in so many of these cases of fat intolerance; the child got a secondary respiratory infection; within three or four days bronchopneumonia set in; the patient showed no resistance to the infection and died in a rather short time.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Keratomalacia.
Bronchopneumonia.

ANATOMIC DIAGNOSES

Multiple lung abscesses.
Bronchopneumonia.
Nephrolithiasis.
Keratomalacia.
Emaciation.
Congenital abnormality of the gall bladder.
Chronic pancreatitis.
Cystic dilatation of the pancreatic ducts.

PATHOLOGIC DISCUSSION

DR. TRACY B. MALLORY: Autopsy showed several very interesting things. The first and most obvious finding was a congenital atresia of the cystic duct with almost complete atrophy of the gall bladder. We estimated it as about one-sixth of the normal size. The hepatic and common ducts however were patent, so bile ought to have come through into the intestine.

At the time of autopsy we did not notice anything wrong with the pancreas. We did not attempt to probe the pancreatic duct. When the slides came through however we found that there was extremely marked disease of the pancreas. Practically all the acinar tissue had disappeared. The ducts were extremely dilated, many of them filled with hyaline bodies which were often suggestive of corpora amylacea of the prostate. The ducts did not look as if they could have functioned at all. I think there is very little doubt that along with the congenital atresia of the cystic duct there must have been a similar atresia of the pancreatic duct. The islands of Langerhans were perfectly normal, whereas the interstitial tissue was somewhat increased and the acini were almost completely obliterated.

The lungs showed, instead of an ordinary bronchopneumonia, multiple abscesses, evidently spreading by the bronchial tree. They were limited to the right lower and left upper lobes. Histologically they were interesting in that they showed a very large percentage of mononuclears as well as polynuclears. Cultures showed hemolytic streptococcus. It is interesting that the differential count in the blood also showed a rather high mononuclear percentage.

One other finding that may perhaps be connected with vitamin deficiency was the presence of a large number of minute calculi in one kidney pelvis, almost like prostatic concretions.

DR. CHESTER M. JONES: How does this differ from the so-called celiac disease so far as the clinical picture is concerned?

DR. HIGGINS: This differed from celiac disease only in that it was of shorter duration. The child did not show some of the symptoms of chronicity such as variation in the size of the abdomen, etc.

DR. HUGO B. C. RIEMER: I should like to ask about the atresia of the cystic duct. He may not have had congenital atresia. In deficiency disease we often get hyperplasia of all the mucous membranes throughout the system. It seems to me that the duct would suffer with the rest. Might it not be a secondary rather than a primary condition, and the absence of fat soluble A be the primary cause? Why must we assume here some other cause when we know definitely that the absence of fat soluble A causes this condition, which is so well demonstrated in the eyes?

DR. MALLORY: I do not believe we could swear that these duct changes were congenital in origin, although it strikes me as more probable. The atrophy of the gall bladder and pancreas was so extreme that the process must have been going on for a long time, perhaps even in utero. I should assume that his vitamin deficiency was due to faulty absorption rather than to anything else.

DR. HIGGINS: How do the pathologic findings here compare with the pathologic findings in animals that have been deprived of vitamin A?

DR. MALLORY: I frankly do not know much about it.

DR. HIGGINS: Do you think there is anything in the mucosa of the intestine such as atrophy which might explain the poor absorption of fat?

DR. MALLORY: The mucosa showed anything but atrophy. It looked more like hyperfunction to me. There was an unusual degree of mucous secretion,—rather definite hyperplasia I should say.

DR. HIGGINS: Of course this child apparently at one time before he came in had been forcefully fed. Is it possible that he may have aspirated fat globules like cod liver oil or something of that nature that served as seed for the formation of these lung abscesses?

DR. MALLORY: I think that is quite possible.

DR. HIGGINS: Did you see fat localized in the lungs?

DR. MALLORY: We have not attempted to stain the lungs for fat. There certainly however was an unusual number of mononuclears in the abscesses but not in the other alveoli.

DR. RIEMER: Did you find any proliferative changes?

DR. MALLORY: No.

DR. RIEMER: The stools of that infant were

reported to me by the nurse as being putty-colored. It might have been a good plan to feed it bile. The condition of the eyes clearly indicated that there was an absence of fat absorption and that fat was not getting into the system. It seems that bile is necessary to emulsify the fat in order for it to be absorbed.

DR. MALLORY: The lack of jaundice of course makes us think that he must have been getting some bile through.

DR. HIGGINS: I think his stools colored up fairly normally for bile. But they did show huge amounts of fat before we took him off his fat diet.

What was the composition of the stones?

DR. MALLORY: I do not know.

DR. JONES: Were the stools examined for fat? Do you know whether it was split fat or not?

DR. HIGGINS: It mostly was not split. 70 per cent of the fat was neutral fat.

DR. JONES: Pancreatic lack leads to failure of absorption. The fats could not have been absorbed to any extent if there was no bile at all in the intestine.

DR. MALLORY: I do not believe there is any question at all that in the later stages of this disease he had definite pancreatic lack, whatever the original cause may have been.

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THE MEETING OF THE MASSACHUSETTS MEDICAL SOCIETY

WHILE it is too early to make any adequate appraisal of the scientific and social features of the annual meeting of the Massachusetts Medical Society it is certainly conservative to say that it was the outstanding meeting within the memory of the present generation.

The papers and discussions were of practical and educational quality especially interesting to practitioners.

The Shattuck lecture gave Dr. Primrose an opportunity to exhibit the best of Canadian thought in building his reasoning and conclusions on the three great epochs of medical history, interspersing the recital with apt and humorous quotations from literature and legend.

His encomium of Dr. Cushing was appreciated as is always a public tribute extended by one great man to a contemporary.

If one phrase in his address is to be remembered it will be "Today we recognize no finality in the progress of surgery."

It was a pleasure and inspiration to see this man eminent in his chosen field and recognized by his peers as worthy of the high office which he occupies, that of President of the American Surgical Association.

Those who were privileged to meet and hear him will look forward to his coming again.

THE ANNUAL DISCOURSE

The expectation of a notable, appropriate, and stirring address, which was the natural reaction to the announcement of the selection of Dr. Harvey Cushing to deliver the Annual Oration, was fully realized.

In presenting the facts pertaining to the founding of this Society and the civic services rendered by the men who brought the structure to its present imposing proportions, the orator gave free rein to his interpretation of the ambitions and loyalty of the strong-minded men who have guided its progress through its one hundred and fifty years.

On the records and accomplishments of the past he built into the discourse enduring lessons for those who are now in control and also for those who are to be selected to carry the responsibilities of the future.

Like the true historian, he wove the lessons of the experiences of nations and scientists into the fabric of human experience in a way to impel receptive minds to strive for the highest ideals of service to humanity.

His fears and doubts found expression throughout the assumed questions by Dr. Holyoke concerning which the medical profession is striving to find true answers.

If Dr. Cushing's record had not appeared in the program of the Sesquicentennial Anniversary we would have essayed the task of making reference to it but will refer our readers to that section as it appears on page 1023 of the issue of May 14.

By his oration, Dr. Cushing has taken an important part in making this meeting one that will occupy a commanding position in the history of the Society and this edition of the *Journal* will be read by the Fellows with great interest and will be of value to future students of the history of the Society.

SOME OF THE OTHER INTERESTING FEATURES OF THE MEETINGS

The talking motion pictures in the Ballroom of the Statler were of unusual interest together with the discussions amplifying the subjects presented.

The clinics at the Massachusetts General Hospital drew delegations from all over the State.

About two hundred and fifty persons visited the Larz Anderson estate although the sky was overcast.

The several scientific sections were well attended. These were uniformly instructive. The papers presented will appear in later issues of the *Journal*.

The invitation extended by the Boston Surgical Society to hear the oration by Professor George Grey Turner, M.S., of England and witness the award of the Bigelow Medal was appreciated by many of the Fellows. The record of this meeting will appear in a subsequent issue of the *Journal*.

Depressing weather conditions and the meetings of the American Medical Association conspired to prevent the attendance of many prominent members of the Society, but even with these handicaps the registration together with those who did not secure badges probably combined to reach the expected figure of one thousand.

Further reference to the meeting will appear next week.

AN EYE FOR A TOOTH

THE Autocrat of the Breakfast Table tells us somewhere of the solemn reverie into which he fell one evening at an annual dinner of the State Dental Society, where he was the guest speaker, fascinated by the inexorable grinding of the molars so far as the eye could reach down the great tables, hypnotized by the flashing of the incisors; awed by the steady occlusion of the bicuspids. The importance of our dental armamentarium took on a new meaning for him from that night.

We have, indeed, been appreciating to an increasing degree the importance of teeth in our lives and particularly their bearing on health and disease. We can easily arouse in ourselves a lively sympathy for that Boston merchant of a brace of generations ago who was born without teeth—and never acquired any. Fortunately he was in the china business and so had opportunities for rectifying Nature's omission which few of us possess.

Be that as it may, the United States Public Health Service, which generally manages to put its finger on the point of greatest importance, has issued an appeal for the preservation of the six year molar—that connecting link between the old and the new—called often, with justice, the keystone of the dental arch. This permanent tooth, partly formed even before the birth of the child, reflects more importantly than does any other the factors which influenced his fetal development and his health and nutrition during the first four or five years of his life. The health of the mother during pregnancy and nursing has left its record on this tooth, and on its enamel is written the history of the early diseases of childhood.

This tooth, unfortunately, is often mistaken for a temporary one and is allowed to decay and with its loss goes government of the position of all the other permanent teeth which are to follow. The position of this first permanent molar is consequently of importance, and as this is governed by the presence of the temporary molars, we are brought to realize that the loss of any tooth may have a serious bearing on the whole balance or occlusion of the mouth.

THE INTERSTATE POST GRADUATE MEDICAL ASSOCIATION

AMONG the meetings scheduled for next Autumn, that of the Interstate Post Graduate Medical Association occupies an important position. A tentative program was published in this *Journal*, May 21, 1931.

The great educational value of this session will not be appreciated unless one reads the program with care, for, as the title of this organization suggests, the treatment of the subjects to be discussed will represent the advanced thought and experience of authorities in the several departments of medicine.

These meetings will attract progressive physicians from all parts of this and some sections of other countries, and that hiatus always existing between medical literature and the latest knowledge will be covered so that an ambitious person may at this time find the more recent solutions of many medical problems.

One matter of especial interest to New England is the recognition of our doctor Henry A. Christian, as the fitting president of the association.

His leadership in internal medicine is recognized and his occupancy of the presidential chair will have its influence in stimulating interest in the meetings and augmenting the attendance.

This organization has had the reputation of utilizing the time scheduled almost entirely for scientific work; there will be no dawdling and with only one especially important social feature, that of the dinner at the close of the session.

It has been said that the cream of the profession is credited with supporting the association, hence; all who are able to attend will find opportunities for the best available postgraduate instruction.

New England should be represented by those who can profit by these meetings.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

CUSHING, HARVEY M.D. Harvard University Medical School 1895. Moseley Professor of Surgery at Harvard Medical School and Surgeon-in-Chief of the Peter Bent Brigham Hospital. Page 1235.

PRIMROSE, A. C.B., M.B., C.M. (Edinburgh), F.R.C.S. (England), LL.D. (Edinburgh). M.D. University of Edinburgh 1886. F.A.C.S. Dean of the Faculty of Medicine and Professor of Clinical Surgery, University of Toronto. Consulting Surgeon, Toronto General

Hospital and Consulting Surgeon, Hospital for Sick Children, Toronto. President, American Surgical Association. His subject is: "The Evolution of Modern Surgery." Page 1245. Address: 100 College Street, Toronto, Ontario, Canada.

RAPOPORT, BORIS. M.D. Tufts College Medical School 1914. Visiting Anesthetist to the Beth Israel Hospital. His subject is: "Observations on Spinal Anesthesia with a Report of 1875 Cases." Page 1254. Address: 270 Commonwealth Avenue, Boston.

DOWNING, JOHN G. A.B., M.D. Harvard University Medical School 1915. Assistant Dermatologist, Beth Israel Hospital. Consulting Dermatologist, U. S. Public Health Service, Boston Health Department. Dermatologist, St. Elizabeth's Hospital. His subject is: "Blastomycosis. Report of a Case." Page 1259. Address: 520 Commonwealth Avenue, Boston.

PYLE, EDWIN. M.D. Columbia University College of Physicians and Surgeons 1915. Formerly, Associate Attending Surgeon, St. Luke's Hospital in charge of Orthopedic Service. Assistant Surgeon, New York Orthopedic Hospital. Attending Orthopedic Surgeon, Sea View Hospital. Now attending Orthopedic Surgeon, Waterbury Hospital. His subject is: "Cystic Degeneration of the Semilunar Cartilage." Page 1260. Address: 95 North Main Street, Waterbury, Conn.

MISCELLANY

A BROADCASTING MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

COMMON COLDS*

PREVALENCE

The common cold is the most frequent of all human ills. Though it is almost never a cause of death, it produces more days of illness and more loss of time from work than any other type of sickness. This is particularly true of the temperate zone, less true in the tropics. The disease occurs throughout the world—from the Arctic Circle to the Equator, but is less prevalent in the tropics, runs a milder course there, and is seldom followed by severe secondary complications.

Various studies have shown that in the temperate climates, the average person has about two colds a year. A few fortunate individuals never have colds, another small group have colds four or five times a year, but the great mass of the population has at least one, more probably two, colds a year. This means that an attack of the disease does not confer permanent immunity, as happens in so many diseases.

*WBZA radio broadcast May 27, 1931 at 5:20 P. M.

SEASONAL PREVALENCE

Colds are rare during the summer months. The curve of incidence rises rapidly in late October, reaching its peak about the end of the month. A drop occurs in the curve, then a second rise, which usually reaches a higher peak than the first, the highest point usually coming in the latter part of February. In other words, the average person has his first cold in late October, then a period of temporary immunity for three months and a second cold in February. Thus the incidence curve of colds suggests that there is a definite relationship between changes in atmospheric temperature and the occurrence of colds.

One important factor in the production of colds seems to be a rapid drop in atmospheric temperature. But colds are not a necessary concomitant of cold weather, as is shown by the experiences of the polar explorers. Peary, MacMillan, Byrd and other polar explorers assure us that the members of their expeditions do not suffer from colds during the severe exposure incident to their work, but frequently contract colds on first contact with the outside world. This is the story also that comes from Labrador, Spitzbergen and other isolated populations in frigid zones. One explanation of this phenomenon is that colds are a contact infection, and require a large population with rapid transportation and thus frequent contacts in order that the disease may continue to propagate itself.

DEFINITION OF A COLD

A cold is an acute inflammation of the membranes of the upper respiratory tract. It usually begins in the nose, then extends to the throat, and finally to adjacent membranes. It is usually accompanied by a feeling of weakness, headache and sometimes fever. The acute stages last two to four days. Onset is usually sudden — recovery rather slow. Secondary and sometimes serious complications may follow colds, such as infection of the ears, particularly in children, infection of the sinuses, bronchitis, and most important of all, pneumonia.

THE CAUSE OF COLDS

We do not know the causal agent of colds. The disease has been studied very extensively from two points of view:

1. The cause of colds is an infectious agent, spread by direct contact from person to person.
2. The cause of colds is a disturbance in bodily physiology, due to change in our environment, particularly a drop in atmospheric temperature, or due to exposure to drafts and chilling of the body surface.

1. Infectious Nature of Colds

There is a mass of evidence which indicates that colds are due to an infection, which is spread from person to person. This unknown agent exists in the secretions of the nose and mouth of persons who have an acute cold, but is only present for three or four days. It is spread by direct contact. The

infected person develops symptoms within one or two days after exposure. This has been clearly shown in the studies of acute respiratory disease in isolated communities — South Alabama, Labrador, and the West Indies.

But bacteriological studies of these secretions from the nose and throat of persons with acute colds have been of no avail. Studies have been made of the bacteria of the nose and throat of normal persons throughout a long period of time. During the studies, at one time or another, many of these persons have had colds. A large number of bacteria were found in the throat, either as constant or casual inhabitants, but no single type has been incriminated as the cause of the infection.

2. Influence of Environmental Factors in Production of Colds

The very word "colds" suggests the popular conception that the disease is due to changes in atmospheric temperature. We have already pointed out the relationship between colds and season. It has frequently been noted that epidemics of colds follow sharp drops in temperature. Observations have been made on colds in the tropics, where the temperature is constant throughout the year, the temperature of the coldest night seldom dropping lower than 68°F. But even under these tropical conditions outbreaks of colds were found to coincide with sudden drops in temperature of a few degrees. Paul noted on the nonmagnetic ship "Carnegie" that the scientists and crew would be free from colds for long periods while at sea and during equable temperature, but that an epidemic occurred when the ship suddenly entered the cold Humbolt current.

Chilling of the body surface seems to predispose to colds. This may occur when those persons with a sedentary occupation are exposed to draft or when individuals sit at work all day with wet feet, or whose working place is in a cold, humid atmosphere.

We may conclude, therefore, that environmental influences play an important part in the incidence of colds, though we cannot state that colds are caused by *exposure alone.*

COMPLICATIONS OF COLDS

An acute cold is self-limited (5-7 days' duration) and seldom is serious. It often paves the way for serious secondary conditions, such as infection of the antrum and other sinuses, infection of the ear, bronchitis and pneumonia. These conditions are due to the bacteria with which we are familiar. It has been found that when persons with an acute cold expose themselves to chilling, they often develop pneumonia. The fourth to fifth day of the cold is the critical period.

PREVENTION OF COLDS

No practical method for the prevention of colds has been discovered. It is almost impossible for a person in active life to avoid all contact with persons with acute colds during the epidemic season. Invalids and infants can and should be protected, for both of these groups suffer severely from the complications of colds. Protection is obtained by prevention of contact with persons who have colds and by prevention of exposure to rapid changes in temperature.

Gargles and local disinfectants are of no proved value. We have no conclusive evidence that hardening the body by cold baths, outdoor sleeping porches and so forth have reduced the susceptibility to colds in the least. Proper ventilation, heating, and humidification probably aid in the prevention of complications of colds, particularly sinusitis. Working, living, and sleeping rooms should be well ventilated, and should not be overcrowded. People working quietly should avoid drafts, and the air of the workroom should have the proper temperature and humidity.

In view of our present opinion as to the cause of colds, it would seem that vaccines are of little value in the prevention of the onset of the acute cold, but may be of real value in prevention of the chronic complications that may follow the acute attack.

TREATMENT OF COLDS

A person with a cold should guard against fatigue, exposure, and particularly against chilling of the body surface during the acute attack. Rest in bed during the early stages—particularly during the period when the person has fever—may prevent the development of serious consequences to the patient, and also check the transfer of the disease to others in the community.

Most families have their own favorite home remedies for the treatment of colds. We have no evidence that these remedies influence in the least the course of the disease or cut short the duration of the illness. They do relieve some of the symptoms, make the patient more comfortable, and other members of the family are made happy because something is being done for the patient.

SUMMARY

We do not know the cause of colds. There is strong evidence that the disease is due to an infectious organism, probably a filterable virus. We believe that the infection is spread by direct contact, from person to person. Some people are entirely immune, but most people contract the infection once or twice a year. We have strong evidence also that environmental factors, particularly an abrupt drop in atmospheric temperature, play an important part in the production of colds. The acute cold itself is self-limited in duration and seldom causes death. It is often followed by secondary complications, some of them serious. We have no specific method for the treatment or prevention of colds, except avoidance of exposure to infection. Since everyone living an active, busy life is brought into close contact with a large number of other people, it is not possible for one to avoid exposure during

the epidemic seasons. The serious complications that sometimes follow an acute cold can be avoided in some instances by rest in bed and avoidance of chilling of the body surface during the acute stages of the disease.

HEALTH INSTRUCTION

While summer is a more healthful season with respect to some diseases it has its dangers.

Have family doctors taken pains to ascertain whether summer hazards are guarded against? If not why not begin and assume the functions of the family adviser and convince the people that the family doctor has a place in guarding the health of his clientele?

If doctors would unite in health talks to the people a great deal would be accomplished in personal preventive medicine. Summer brings the dangers of water sports, inattention to properly regulated diets, the perils of contaminated water supplies and especially the accidents of Fourth of July celebrations.

Radio publicity may be invoked as an adjunct to direct personal instruction.

MORTALITY RATES

Telegraphic returns from 81 cities with a total population of thirty-six million for the week ending May 23, indicate a mortality rate of 11.7 as against a rate of 11.9 for the corresponding week of last year. The highest rate (18.9) appears for San Antonio, Texas, and the lowest (6.6) for Lynn, Mass. The highest infant mortality rate (18.6) appears for New Bedford, Mass., and the lowest for Long Beach, Calif., Lynn, Mass., Miami, Fla., New Haven, Conn., San Diego, Calif., Schenectady, N. Y., South Bend, Ind., Spokane, Wash., and Utica, N. Y., which reported no infant mortality.

The annual rate for 81 cities is 13.4 for the twenty-one weeks of 1931, as against a rate of 13.1 for the corresponding weeks of 1930.

COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1930 AND SEVEN YEAR AVERAGE

MONTH ENDING MAY 30, 1931

	1931					1930			
Diseases	Week ending May 9	Week ending May 16	Week ending May 23	Week ending May 30	Average cases reported for week corresponding to May 30 for past seven years	Week ending May 10	Week ending May 17	Week ending May 24	Week ending May 31
Cerebrospinal Men.	1	1	2	—	1	1	4	3	2
Chicken Pox	49	101	103	107	58	92	63	74	45
Conjunctivitis Inf.	6	—	4	—	2	—	1	—	1
Diphtheria	9	17	6	3	18	11	21	9	10
Encephalitis Epid.	—	2	—	—	1	2	—	1	—
German Measles	10	11	9	10	51	65	57	89	42
Influenza	7	2	2	2	5	10	—	4	2
Malaria	—	—	1	—	—	—	—	—	—
Measles	582	699	634	435	218	61	75	50	26
Mumps	58	67	63	80	53	37	52	37	31
Pneumonia (Broncho)*	18	24	22	24	22	21	25	23	9
Pneumonia (Lobar)	41	46	17	21	23	49	63	29	16
Poliomyelitis	—	—	—	1	—	—	1	—	—
Scarlet Fever	47	42	54	35	61	88	71	63	34
Septic Sore Throat	2	3	1	1	—	—	1	1	1
Tetanus	—	—	1	—	—	—	—	—	—
Trichinosis	1	4	3	1	—	—	—	—	—
Tuberculosis (Pul.)	23	20	28	19	34	30	28	21	45
Tuberculosis (O. F.)	3	—	4	2	3	4	2	5	3
Typhoid Fever	—	5	2	1	3	1	—	1	1
Undulant Fever†	—	—	1	—	—	—	—	—	—
Whooping Cough	52	31	47	47	48	35	35	45	31
Gonorrhea	14	14	38	31	30	28	21	26	55
Syphilis	49	23	46	25	31	28	47	32	29

*Made reportable January 1, 1925.
†Made reportable August 14, 1928.

Remarks: No cases of cholera, Asiatic glanders, plague and yellow fever during the past seven years.

CORRESPONDENCE

THE APPROVAL OF A PLAN TO IMPROVE THE HEALTH OF SCHOOL CHILDREN

The School Committee of the City of Boston
Administration Building, 15 Beacon Street
Department of School Hygiene

June 5, 1931.

To the Editor, *New England Journal of Medicine:*

The Boston School Committee has recently approved the plan of the Department of School Hygiene whereby the department seeks to interest parents whose children are eligible for admission to kindergarten and first grade classes of the public schools in securing for this pre-school group the correction of remediable physical defects before the children become a part of the school population.

The following circular will be distributed in the public schools among children who have brothers and sisters who will come to school for the first time next September. These circulars will, in this manner, reach the parents of children of pre-school age.

THE SCHOOL COMMITTEE OF THE CITY OF BOSTON
Administration Building, 15 Beacon Street
Department of School Hygiene

June, 1931.

To Parents and Guardians:

The Department of School Hygiene of the Boston Public Schools advises you that your children, if old enough to enter the kindergarten or first grade classes for the first time next September, should be examined by your family physician for conditions which are likely to interfere with their progress in school. If your doctor discovers any defects which could be relieved by proper treatment it will help your children if such defects are corrected *before* they come to school instead of postponing action until they become ill from these defects.

If your children have defective tonsils and adenoids; if they cannot breathe properly; if their teeth are in need of dental care; if they are far-sighted or near-sighted; if they have abnormal posture or flat feet; if they are hard of hearing; if they are undernourished or are nervous; if they are troubled with any defects—these conditions should be treated by your family physician *at once* and before the defects or conditions will interfere with school activities.

Every child *must* be vaccinated against smallpox before he is permitted to enter school. Every child should be protected against diphtheria *before* he comes to school.

Your family doctor will attend to these matters at your request. You are urged to consult him now. *Save* your children from illness and from unnecessary loss of school time.

Play fair with your children! Help them to succeed by preparing them to do their best at school. They can do their best only if they are healthy, happy, and free from preventable and correctable handicaps. Consult your family doctor at once; or if you have no family doctor take your children to the nearest health unit, hospital, or dispensary.

Very truly yours,
SOLOMON H. RUBIN, M.D.,
Acting Director School Hygiene.

Approved:
JEREMIAH E. BURKE,
Superintendent of Public Schools.

Another circular addressed to physicians, a copy of which follows, will be mailed to them. The circular letter speaks for itself.

Dear Doctor:

The Department of School Hygiene of the Boston Public Schools, in coöperation with the Health Department of the City of Boston and the Department of Public Health of the Commonwealth of Massachusetts, desires to enlist your active interest in its preventive program for children who are to enter the kindergarten and first grade classes for the first time next September. You are urged to communicate with your patients and request them to bring to you their children who belong to this group for physical examination and the correction of remediable physical defects, in order that they may fully enjoy the educational opportunities afforded in our schools.

All children who have hypertrophied tonsils, defective nasal breathing, carious teeth, defective vision and hearing, cardiac and respiratory diseases, malnutrition, anaemia, flat feet, abnormal posture and such other correctable physical defects as are likely to impair their health or interrupt their studies through unnecessary absences from school and thus interfere with their scholastic progress should have correctional attention at the hands of the family physician or dentist *before* they enter school.

Your attention is directed to your opportunities in this almost untouched field of medical activity. You are in a position to become a positive factor personally, or, in coöperation with the public health agencies, to render a type of constructive medical service to a group of children who are commonly referred to as the "neglected age group".

If, in the interest of all concerned, you believe that these children should be treated at a clinic, the health units, hospitals, and dispensaries in our City are fully equipped and are willing to render this service to your patients.

The Massachusetts Department of Public Health has prepared a card, a copy of which is enclosed, endorsing this program and urging parents to have their children examined and their physical defects corrected by the family doctors. The Commissioner of Health of the Commonwealth states: "these cards may be used by the private physician in order that any possible onus of personal benefit to the physician through recommending this service himself may be mitigated". Additional cards may be obtained upon application to the office of the De-

partment of School Hygiene, Telephone HAYmarket 5500.

Your full coöperation is urgently requested.

Very truly yours,
SOLOMON H. RUBIN, M.D.,
Acting Director School Hygiene.

Approved:
JEREMIAH E. BURKE,
Superintendent of Public Schools.

If possible, we propose to meet with local medical societies and endeavor to stimulate interest in the pre-school child.

Meetings with parent-teacher associations, where such organizations exist, and their number is steadily growing, will be arranged for some time before the schools open next September. Such newspaper publicity as will bring before the public the full meaning of this movement will be urged upon editors, and it is hoped in this way to awaken the parents to a full realization of their responsibilities towards that group of children to which medical men refer as the neglected age period of childhood.

If the White House Conference on Child Health and Protection is to bear fruit, the germination of such ideas as will effectively deal with the conservation of child health should be developed by every practicing physician in his own office. Every health agency interested in child life which has not assumed an attitude of self-sufficiency will gladly share its activities with the family physicians if the latter will accept these responsibilities.

Doctors should, therefore, regard our public health agencies as their associates, guides, and sources of statistical and scientific information in this work of health conservation among children. Not as their antagonists, not as their competitors, not as forerunners of State medicine do public health agencies function but as constituted authorities who are charged with a duty to perform in any field where child life is neglected when, as, and if the practicing physicians elect to ignore their opportunities.

Let us, as practicing physicians, without further much ado, become a positive factor in developing a new type of child for admission to school—a type free from correctable physical defects, vaccinated against smallpox, and protected against diphtheria.

Very truly yours,
SOLOMON H. RUBIN, M.D.,
Acting Director School Hygiene.

RECENT DEATHS

JOHNSON—DR. WILLIAM AUGUSTUS JOHNSON, a retired fellow of the Massachusetts Medical Society, died at his home in Lowell, June 2, 1931, aged 72 years.

He was born in Saco, Maine, June 28, 1858, attended the public schools and Phillips Exeter Academy and took his M.D. degree from the Jefferson Medical College, Philadelphia, in 1882. The next year he settled in practice in Lowell and joined the state medical society. In 1926 his name was placed on the retired list, as his health was impaired and he was rendered inactive. He was on the staffs of both St. John's Hospital and the Lowell General Hospital. He was a Mason, holding membership in Kilwinning Lodge, Mt. Horeb Royal Arch Chapter, Ahashuerus Council and Pilgrim Commandery, Knights Templar; also Chevalier—Middlesex Lodge No. 2, Knights of Pythias. For many years Dr. Johnson was a member of the Yorick Club and of the Vesper Country Club.

SHAW—DR. THOMAS WIGNALL SHAW, of Whitman, died suddenly in that town, June 2, 1931, aged 62.

He was a graduate of Tufts College Medical School in 1897, joined the Massachusetts Medical Society from Lynn in 1918 and moved to Whitman the following year.

He is survived by a married daughter.

OBITUARY

RESOLUTIONS OF THE LYNN HOSPITAL STAFF ON THE DEATH OF DR. ELLSWORTH P. GARIPAY

The spectacle of Death to physicians is not the shock that it is to the average human being. We are familiar with it; we confront its mysterious approach every day; we grapple with the grim monster, always hoping to vanquish it or at least to delay its inevitable triumph. When it comes, however, to one of the fraternity, how quickly we revert to the average type; how naturally we become the sorrowful friends, the compassionate brothers; all the more so, if one is suddenly taken from us in the prime of life, in the midst of professional activities and promising expectations!

These thoughts came to us when the fulminating death of our colleague, Dr. Ellsworth P. Garipay was announced. The wave of sympathy that went to his family was so spontaneous and so general that it seemed almost a tangible proof of the profound esteem in which he was held. Public sentiment, public outbursts of this nature are generally excellent criteria; they are based on the qualities and the virtues of the departed, which in Dr. Garipay's case, were those of the true physician—kindness, sympathy, charity, combined with professional ability and ethical conduct.

He was taken from us in the midst of a very active career; he was the type of the family physician, the good old-fashioned, general practitioner, whose restoration in the community is prayed for by the best minds in the profession. Can a better eulogy be pronounced? Can a better epitaph be dedicated to his memory?

I move you, Sir, that the profound sympathies of this body, the Staff of the Lynn Hospital, where he received his internship, and where he served so faithfully, where he met his helpful life companion,

be offered to his family; and I move you further, that this expression of our Sorrow and friendly memories be spread upon our records.

J. ARMAND BEDARD, M.D.,
CHARLES L. HOITT, M.D.,
Committee.

NEWS ITEM

AN HONOR CONFERRED ON DR. FRANCIS D. DONOGHUE—Following the example set by Calvin Coolidge, Former President of the United States, President Hoover has included Dr. Francis D. Donoghue in the group of physicians to represent the United States at the International Conference on Industrial Accidents and Diseases to be held in Geneva in August next. Dr. Donoghue has been for many years the medical adviser of the Department of Industrial Accidents of Massachusetts. He also conducts a large surgical practice.

NOTICES

THE ANNUAL NARCOTIC REGISTRATION

Returns must be filed by July 1 proximo or penalty attaches to delinquency.

REMOVAL

Dr. Juanita P. Johns announces the removal of her office to 144 Commonwealth Avenue (near Dartmouth Street) Boston, Mass.

REPORT AND NOTICE OF MEETINGS

HARVARD MEDICAL SOCIETY

The last meeting of the year of the Harvard Medical Society was held at 8:15 in the amphitheatre of the Peter Bent Brigham Hospital on the evening of May 26, 1931. Dr. William P. Murphy presided.

The surgical case was presented by Dr. Dial: A twenty-five-year-old white male complained of a painful, swollen, tender knee of six weeks' duration. Family history and past history are irrelevant. Six weeks before admission the patient suffered a sore throat, general malaise, feverishness, and chills. He remembers very little of what happened in the first few days of his illness. His legs became swollen up to the hips and, as the general swelling subsided, the right knee remained swollen, painful and tender. He had jaundice for two or three days, nocturia and cloudy urine. For three weeks the local doctor found blood in his stools.

Physical examination showed a pale, cachectic man. Positive findings consisted of a coated tongue, and a swelling of the right leg in the region of the knee, which could not be moved without causing pain. Above the knee on the medial aspect of the thigh was an area of softening without fluctuation. Temperature 102° which gradually subsided. Red blood count—2,500,000. White blood count— 23,000. Differential normal. Phenolsulphonphthalein excretion—40 per cent. in 2 hours. Urine—specific gravity varied from 1010 to 1020 on three examinations,—hyaline and granular casts, clumps of white blood cells, and a few red blood cells, all of which findings decreased on successive examinations.

Aspiration of the joint produced three c.c. of blood which, smeared, was found to contain a few spherical bodies, persumably cocci. Aspiration of the soft area produced 25 c.c. of clear yellow fluid, followed by blood; all of these specimens clotted immediately on standing. Cultures showed no growth. X-rays showed soft tissue swelling, some erosion of the cartilage of the medial side of the condyle of the femur, and some narrowing of the joint cavity. The diagnostic impression is infectious arthritis; although toxic arthritis, neoplasm, and hemophilia were considered.

The medical case was presented by Dr. Young as an unusual case of primary anemia with free hydrochloric acid in the stomach. A 56-year-old white female, with negative past and family history, entered the hospital one year ago complaining of weakness, anorexia, indigestion, dyspnoea, palpitation, oedema, occasional chills, jaundice, and clay-colored stools; x-ray had shown a non-functioning gall-bladder but operation had been refused. At admission she also had a sore mouth and some paresthesias of recent onset.

Physical examination showed a pale, jaundiced woman with the positive findings of: linear retinal hemorrhages, soft apical systolic murmur, right inguinal hernia, internal hemorrhoids, red blood count of 1,200,000, Hemoglobin 35, smear characteristic of pernicious anemia. Stomach contents contained free hydrochloric acid. Unable to retain liver, she was placed on 8 viais of the extract daily. The reticulocyte response reached 19 per cent. The red blood cells rose gradually to 4,400,000 four months after institution of treatment, at which time she still complained of paresthesias. Although she continued to take liver extract, the red count fell during the next four months to 3,300,000. At this time x-rays of the gall-bladder were repeated and showed a non-functioning gall-bladder, containing calculi. At operation a gall-bladder four times normal size, and containing stones, was removed. An area of perihepatitis was seen. After discharge she became progressively worse although continuing with 8 vials of liver extract daily so that five weeks before readmission she developed pains in legs, increased paresthesias, paresis of both legs, and urinary retention. Neurological examination showed ataxia and weakness of the upper extremities, paralysis and analgesia of the lower, with loss of vibratory and position sense. Hyperreflexia and bilateral positive Babinski's were present. Ankle clonus, unsustained, but greater on the right. The red count had dropped to 1,700,000, white count 3000. Two vials of liver extract were given intramuscularly, followed by one and a half vials the following day. Since then

she has been getting one-tenth of a vial intramuscularly daily. On the fourth day after the institution of this treatment the reticulocytes had risen to 13 per cent., the red cells to 2,100,000; and the mental condition was improved.

The feature of the evening was a moving picture of essential parts of Dr. Cushing's two thousandth operation for brain tumor—in this case a pituitary adenoma. This film, prepared by Dr. Walter W. Boyd, and Dr. Richard U. Light, supplies a remarkable and unique record, which will be a valuable addition to the files of either the Harvard Medical School or the Peter Bent Brigham Hospital.

The second feature of the program consisted of "X-ray Novelties" in which Dr. Merrill C. Sosman delightfully demonstrated the protean value of his specialty. Paleontology, finger bowl artistry, bird hunting and golf, all find in roentgenology a sympathetic and valuable ally.

The meeting adjourned at 10:00 P. M.

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The regular clinico-pathological conference of the New England Hospital for Women and Children will be held at the hospital, Dimock Street, Roxbury, on Thursday, June 18, at 8 P. M., with the following program: 1. Presentation and pathological reports on cases of peritonitis, congenital anomaly of the genito-urinary tract, and acrodynia. 2. Presentation and demonstration with slides, of a case of myeloma. Dr. Muller. 3. Presentation and discussion with special reference to treatment of a case of infantile eczema.

ALICE H. BIGELOW, M.D., *Secretary.*

SOCIETY MEETINGS

CONGRESSES AND CONFERENCES

June 8-14—International Hospital Congress. See page 521, issue of March 5.

June 16—South End Medical Club. See notice above.

June 16-19—Catholic Hospital Association. See page 690, issue of March 26.

June 18—New England Hospital for Women and Children. See notice above.

July 6-11—Medical Clinic, Paris. See page 520, issue of March 5.

July 26-31—Third Congress of the Pan American Medical Association. See page 632, issue of March 19.

July 27—The Post Graduate Course of Ear, Nose and Throat Surgery at the University of Bordeaux, France. See page 951, issue of April 30.

July 27-31—Third International Congress of Radiology, Paris. See page 789, issue of April 9.

Aug. 31 - Sept. 4—Neurologists will meet in Berne, Switzerland. See page 896, issue of April 23.

September 14-17—The American Public Health Association. See page 632, issue of March 19.

October 12-16—An Announcement of the Clinical Congress of the American College of Surgeons. See page 1175, issue of May 28.

October 19-22—The Interstate Post Graduate Medical Association of North America. See page 1125, issue of May 21.

October 19-30—Graduate Fortnight of the New York Academy of Medicine. See page 1230, issue of June 4.

April 4-8, 1932—The American College of Physicians. See notice on page 1232, issue of June 4.

DISTRICT MEDICAL SOCIETIES

Bristol North District Medical Society

September 17—Details to be announced.

Middlesex South District Medical Society

June 24—Golf Association Spring Tournament. See page 1177, issue of May 28.

Plymouth District Medical Society

July 17—Midsummer meeting. See page 1011, issue of May 7.

BOOK REVIEWS

International Studies on the Relation Between the Private and Official Practice of Medicine with Special Reference to the Prevention of Disease, Conducted for the Milbank Memorial Fund. By SIR ARTHUR NEWSHOLME, K.C.B., M.D., F.R.C.P. Volume One. The Netherlands, Scandinavia, Germany, Austria, Switzerland. London: George Allen & Unwin, Ltd. Baltimore: The Williams & Wilkins Company.

This series of volumes of which only the first has been published should be most helpful to the student of the problems involved in the socialization of medicine, and the Milbank Fund is to be congratulated in securing the services of so distinguished and competent an investigator as the author, whose previous contributions are too well known to require comment in this review.

In the Foreword to the first volume by Mr. John A. Kingsbury, Secretary of the Milbank Memorial Fund, the occasion for these studies is described as "the opposition of some members of the medical profession to certain phases of the public health work which the Milbank Memorial Fund helped to inaugurate in one locality, as a part of its participation in the New York State Health Demonstrations. This opposition led the Fund to reëxamine the initial tenets upon which the participation in the health demonstrations were based, in order to make sure that its philanthropic service in the field of public health would not be such as would in any way embarrass or impede the legitimate professional aspirations of the private medical practitioner". Whatever the merits of the opposition, this result is valuable, and the spirit in which these studies are undertaken deserves widespread recognition and adoption.

The first group of countries studied includes the Netherlands, Scandinavia, Germany, Austria and Switzerland; the second group, Belgium, France, Italy, Jugo-Slavia, Hungary and Czechoslovakia; the third Great Britain. "There will be a concluding volume which will summarize for the general reader the subject as illustrated in the countries surveyed, and will give a study of the underlying problems in the practice of preventive and clinical medicine, with suggestions for progress."

The topics considered in dealing with The Netherlands give an idea of the scope of the study: Preliminary Summary; National Conditions; Government; Medical Care of the Poor; Sickness Insurance Societies; Accident Insurance; Hospital Organization; the Treatment of Tuberculosis; the Treatment of Venereal Diseases; Midwifery Service;

Midwives in The Netherlands; the Statistics of Maternal Mortality. Each country is subjected to at least so comprehensive a survey.

The value of these Studies may be very great, and the concluding volume will be awaited with especial interest, but the earlier volumes will present the material on which the conclusions are based. Until these appear, it will be wise to defer attempts at final evaluation of even a part. A few incongruities are to be noted in this first volume, which, however, as a study in trends, cannot be commended too earnestly to the attention of the thoughtful physician and student of social medicine.

There is one point on which the opinion of Sir Arthur Newsholme is expressed incidentally which is now a subject of controversy in the United States. The maternal mortality in this country is reckoned as being very high, "almost as bad as Chili," and most deplorable. It is important to note what has been ignored in much recent publicity, by people who ought to know better, that there is no scientific basis for such statements. The matter is considered in some detail on pages 41-43, and Sir Arthur says, "Evidently the international position is somewhat chaotic; and it is doubtful if the chaos could be removed by the adoption of a rigid and detailed international system of rules, so much depending on the personal bias of the statistician responsible for relegating a dubious certificate embodying more than one item to its right compartment." (Publications interested in the Children's Bureau in Washington, please copy.) How trustworthy are conclusions based on the "International List of the Causes of Death," if "the international position is somewhat chaotic?" The conclusions are worthy of the same characterization "somewhat chaotic". They *may* be true as statements of fact, and for this there is no evidence, but as statements of sound conclusions from sound premises they are worthless.

Russia is not mentioned. Perhaps it was thought that there could be nothing to say about the relation between the private and official practice of medicine, if there were no private practice. But private practice in Russia has not quite disappeared and a study of the fragment remaining might be enlightening.

The book contains a considerable amount of trustworthy and valuable information, plainly stated, under excellent typographical conditions.

Röntgenatlas der Lungenerkrankungen. By Dr. W. Brednow and Dr. E. Hofmann. Published by Urban & Schwarzenberg, Berlin and Wein, 1931.

This small paper-bound atlas of 160 pages containing 85 excellent illustrations is largely devoted to tuberculosis of the lung. There is a description of the normal lung fields with an explanation of the shadows caused by the blood vessels. The Author's technique is given. The different stages of pulmonary tuberculosis are illustrated, including the various types of this disease with complete follow-up studies. The differential diagnosis from an x-ray point of view between bronchogenic and hematogenous dissemination of the disease is illustrated. The authors also present cases illustrating the difference between tuberculosis with cavity and lung abscess; also between tuberculosis with bronchiectasis and uncomplicated bronchiectasis.

In the second chapter diseases of the chest which may simulate tuberculosis are illustrated. All of the cases presented include clinical studies as well as excellent radiographs.

This book should be helpful to all physicians interested in the study of tuberculosis.

Abdomino-Pelvic Diagnosis in Women. By Arthur John Walscheid, M.D. C. V. Mosby Company, St. Louis. Price $12.50.

The introductory chapter deals with anatomical considerations, — measurements of the normal female figure, racial types, sex characteristics, the disposition of fat and hair and topography of the viscera. There are many references to Jayle's L'anatomie morphologique de la femme.

The second chapter is devoted primarily to the causes of diseases of women. It covers a variety of topics including sexual development, sexual life, developmental anomalies, the influence of endocrines and of extragenital diseases, and concludes with the technic and interpretation of such aids in diagnosis as pneumoperitoneum.

The third chapter of 100 pages is devoted to general symptomatology, objective and subjective. It embraces a variety of topics including infantilism, enteroptosis, sterility, hermaphrodism, sexual hyperesthesia and anesthesia, venereal diseases, dysmenorrhea, dyspareunia, menstrual anomalies (with the author's menstrual chart), and vulvovaginal discharges.

The technic of examination of non-pregnant and pregnant women, and the diagnostic significance of the findings is well detailed and illustrated. This occupies nearly 120 pages and concludes Part I of the volume (351 pages).

The second part of the volume (604 pages), which deals with special gynecology in a regional manner appropriately opens with a consideration of the development and morphology of the female sexual apparatus. The plan then pursued is the presentation of anatomical development, traumatic, inflammatory and neoplastic lesions of the female organs. The consideration of the external genitals occupies 126 pages and contains much valuable information of forensic nature. The chapter on the vagina occupies 63 pages, on the cervix 47 pages, on the uterus 121 pages, on the tubes 53 pages, on the ovaries 56 pages, on the pelvis 31 pages, on the urinary tract 38 pages, on the abdominal wall and viscera 40 pages, and on the anus and rectum 6 pages. There

follows a list of 149 references to the literature. A double column index of 38 pages concludes the volume of 1000 pages.

This is a carefully prepared work. As the text indicates it is concerned with the diagnosis of abdomino-pelvic conditions in women. It is not a treatise on therapy. As stated in the preface "the work is intended primarily for the postgraduate student and the general practitioner". The volume adequately fulfills this purpose. For an anthropologic substratum as an essential element in diagnosis the author acknowledges the written permission of Professor Jayle. This feature of the work is noted especially in the introductory chapter of 61 pages. The author has aimed to teach by visualization. This he has successfully succeeded in accomplishing by brief abstracts of case histories of eminent gynecologists of "leading countries" and by 397 well-chosen illustrations. The histories recorded set forth not only typical cases but also in many instances cases which present difficulties and pitfalls in diagnosis. The work then is more detailed than a volume for the postgraduate student and general practitioner. It is a work for the student of gynecology who with practical experience can visualize the subject matter he is reading. Walscheid's presentation of the subject makes appropriate the inscription on the fly-leaf,—"Qui bene diagnoscit bene curat."

Heart Disease. By PAUL D. WHITE, M.D. The Macmillan Company, 1931. Pp. 931. Price $12.00.

This book is the most important practical publication on the subject of heart disease that has appeared in this country during the past decade or two. It contains a complete survey of the entire subject, including the diagnosis, prognosis, and the treatment of heart disease. It is divided into four parts—the first part takes up in detail the various methods of examination that pertain to the subject. The simple elementary aspects of physical diagnosis, inspection, palpation, percussion and auscultation are discussed, and then follow chapters on sphygmomanometry, x-ray, polygraphy, electrocardiography, and other laboratory tests that pertain to the circulation. Part II contains a discussion of the incidence, causes and types of heart disease. Part III includes the various structural changes in the heart such as valvular, muscular, and pericardial diseases. The last part pertains to disorders of function. Here are taken up all the abnormalities in the mechanism of the heart beat, angina pectoris, and the treatment of congestive heart failure. There is a very extensive bibliography that follows, and finally an interesting appendix which contains more than one hundred queries presenting problems that need solution.

This volume is admirably constructed and illustrated. There are numerous charts, figures and heart tracings illustrating the text in one way or another. The printing is very legible. The only criticism that one might make concerning the physical make-up of the book is that it is a little heavy for the reader, and that the publishers might have saved about one hundred pages if the bibliography were printed in smaller type. The contents are very authoritative and purposely avoid controversial points of view and are devoid of intricate theoretical speculations. There is a wealth of information to be obtained about almost any aspect of cardiac disease. The author has very admirably interspersed throughout the various chapters brief paragraphs from important original historic contributions to the subject. Despite the frequent references to other works, one can readily see that much of the contents of this book rests on extensive personal experience that the author has had and upon his numerous publications on the subject in the past.

It is the first book that has appeared in recent times that has combined an adequate discussion of both the simple practical bedside aspects of heart disease with the newer developments in the instrumental study of heart disease like electrocardiography. It ought to serve for some time to come as a standard textbook on the subject for students, practitioners, and consultants.

A Dictionary of Terms Dealing with Disorders of Speech. Compiled by SAMUEL D. ROBBINS, A.M. and SARA M. STINCHFIELD, PH.D. Copyright 1931. Published by the American Society for the Study of Disorders of Speech. Price 65c.

With intensive study in any department of knowledge, the nomenclature is apt to develop at such a rate that the language becomes almost unintelligible to the ordinary reader. It has, therefore, become a most commendable custom to arrange vocabularies on special subjects in systematic form for the benefit of lay readers. This service Mr. Samuel D. Robbins, Director of the Boston Stammerer's Institute and Miss Sara M. Stinchfield, Associate Professor of Psychology at Holyoke College, have done for disorders of speech under the auspices of the American Society for the Study of Disorders of Speech and with the assistance of many well-known educators. The pamphlet which is stated to be preliminary to a more complete dictionary gives in 27 pages definitions of terms alphabetically arranged dealing with the various disorders of speech. Discouraging as it may be to the uninitiated to look over these pages filled with words many of which the ordinary person has never heard, it illustrates forcibly the necessity of a standardized nomenclature in this important and very practical subject. Suggestions and possible corrections are invited by the compilers and such may perhaps be needed but in general the pamphlet bears evidence of most careful preparation and scholarly treatment. It should receive cordial recognition.